U.S. Department of the Interior
Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

ENVIRONMENTAL ASSESSMENT

NUMBER

DOI-BLM-CO-N040-2010-0042-EA

CASEFILE NUMBER

Federal Lease COC27825 (pending issuance of BLM right-of-way grants).

PROJECT NAME

Proposal to Drill Eight Federal Wells from the Proposed PE25 Pad in the South Parachute Field, including constructing an access road and installing surface natural gas and water pipelines.

LOCATION

Township7 South (T7S), Range 96 West (R96W), Section 25 SW¼NW¼, N½SW¼ and Section 26 SE¼NE¼ (Figure 1).

LEGAL DESCRIPTIONS

Surface and bottomhole locations of the proposed Federal wells addressed in this Environmental Assessment (EA) are listed in Table 1.

Table 1. Surface and Bottomhole Locations of Proposed Federal Wells

Proposed Wells	*Surface Locations*	*Bottomhole Locations*
Federal 25-4A	T7S R96W, Section 25 SWNW, 2020 ft FNL, 15 ft FWL	T7S R96W, Section 25 NWNW 210 ft FNL, 840 ft FWL
Federal 25-4B	T7S R96W, Section 25 SWNW, 2015 ft FNL, 25 ft FWL	T7S R96W, Section 25 NWNW 490 ft FNL, 840 ft FWL
Federal 25-4C	T7S R96W, Section 25 SWNW, 2037 ft FNL, 11 ft FWL	T7S R96W, Section 25 NWNW 770 ft FNL, 840 ft FWL
Federal 25-4D	T7S R96W, Section 25 SWNW, 2031 ft FNL, 21 ft FWL	T7S R96W, Section 25 NWNW 1050 ft FNL, 840 ft FWL
Federal 25-5A	T7S R96W, Section 25 SWNW, 2047 ft FNL, 17 ft FWL	T7S R96W, Section 25 SWNW 1330 ft FNL, 840 ft FWL
Federal 25-5B	T7S R96W, Section 25 SWNW, 2053 ft FNL, 7 ft FWL	T7S R96W, Section 25 SWNW 1610 ft FNL, 840 ft FWL
Federal 25-5C	T7S R96W, Section 25 SWNW, 2063 ft FNL, 13 ft FWL	T7S R96W, Section 25 SWNW 1890 ft FNL, 840 ft FWL
Federal 25-5D	T7S R96W, Section 25 SWNW, 2069 ft FNL, 4 ft FWL	T7S R96W, Section 25 SWNW 2170 ft FNL, 840 ft FWL

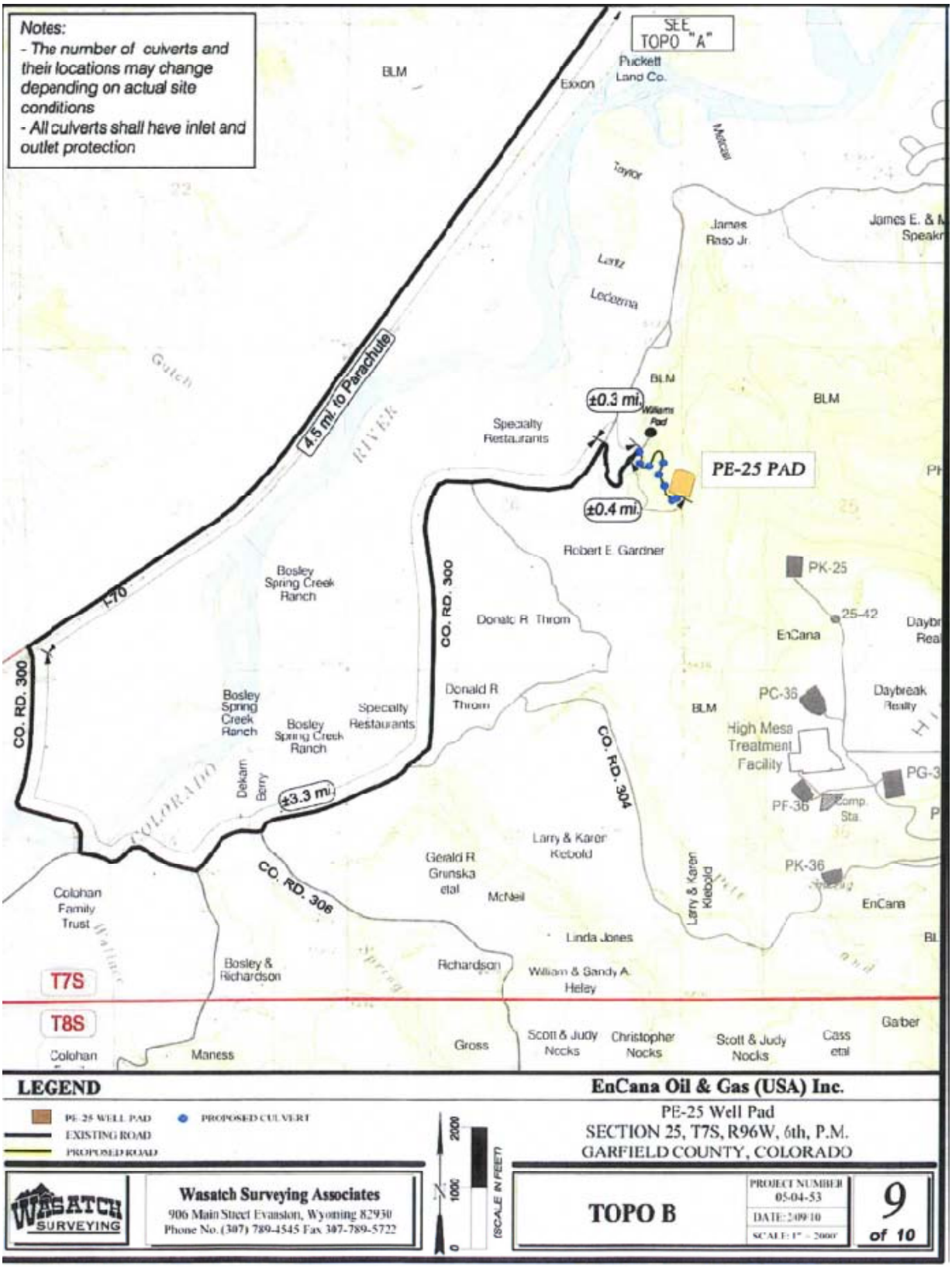

Figure 1. Project Location and Proposed Road Alignment

APPLICANT

Encana Oil & Gas (USA) Inc., Contact Jevin Croteau, 370 Seventeenth Street, Suite 1700, Denver, Colorado 80202.

PROPOSED ACTION

The Proposed Action submitted by Encana is to directionally drill eight Federal wells from the proposed PE25 Pad located on BLM land on the west-facing slope of High Mesa about 3 miles southwest of Battlement Mesa, Colorado. The eastern half of the pad, the eight surface holes and

bottomholes, the production facilities, the surface steel natural gas pipeline, and the surface poly water pipeline would be located in Section 25 on Encana lease (COC27285) and construction, operation, and maintenance of these project components would be subject to the lease terms to be applied in the Applications for Permit to Drill (APDs). The western portion of the pad and access road would be located in Section 26 (off-lease). For off-lease facilities, including portions of the surface natural gas pipeline, construction, operation, and maintenance of these components requires issuance by the BLM of right-of-way (ROW) grants.

The South Parachute Geographic Area Plan (SPGAP) was previously analyzed and approved by the BLM in August 2007. Although neither the PE25 pad nor its associated developments were specifically analyzed in the SPGAP, some of the planned bottomholes initially proposed for the PG25 pad would be reached from the PE25 pad. The PG25 pad is not being actively pursued by Encana because of potential cultural resource conflicts. Since the planned bottomholes fall within the SPGAP planning boundary, the SPGAP standard Conditions of Approval would be applied to this project. The project would be accessed along Garfield County-approved truck routes from I-70 at Parachute (Figure 1).

The well pad would be primarily situated in a sagebrush flat with the road and pipeline constructed in a woodland of Utah juniper (*Juniperus osteosperma*), with a few mature pinyon pines (*Pinus edulis*) scattered throughout the project area. The proposed road would built off the existing Williams SG41-26 access road and commence approximately 300 feet west of the Williams pad; Encana and Williams would share the use and maintenance of the existing SG41-26 access road. The surface pipeline alignment would run in a direct line uphill along the west-facing slope of High Mesa with a terminus at the existing gathering system on the PK25 pad. Construction, maintenance, and reclamation of the road, pad, and pipeline would adhere to the Best Management Practices outlined in the Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (USDI and USDA 2007).

The PE25 pad, with the west portion of the pad to be constructed in sagebrush habitat and the eastern half to be constructed in juniper woodlands, would have a maximum cut of 33.1 feet at the southeast corner and a maximum fill of 25.2 feet at the northwestern pad corner (Figure 2). Construction of the well pad would result in approximately 5.5 acres of new surface disturbance, which would be reduced to approximately 1.5 acres after interim reclamation. The juniper trees cleared during the pad construction would be windrowed at the toe of the fillslope to serve as a sediment barrier or stockpiled along the pad edge for later use in the pad reclamation work.

The road (approximately 0.4 mile in length with a travelway width of 20 feet) would be constructed from the centerline stakes established in the field. The road alignment would begin at a junction point with an existing road west of the SG41-26 pad and involve three switchbacks to gain the elevation necessary to enter the pad on its south edge. The road grade would vary from 5% at the road junction to a 10% pitch near the PE25 pad entrance.

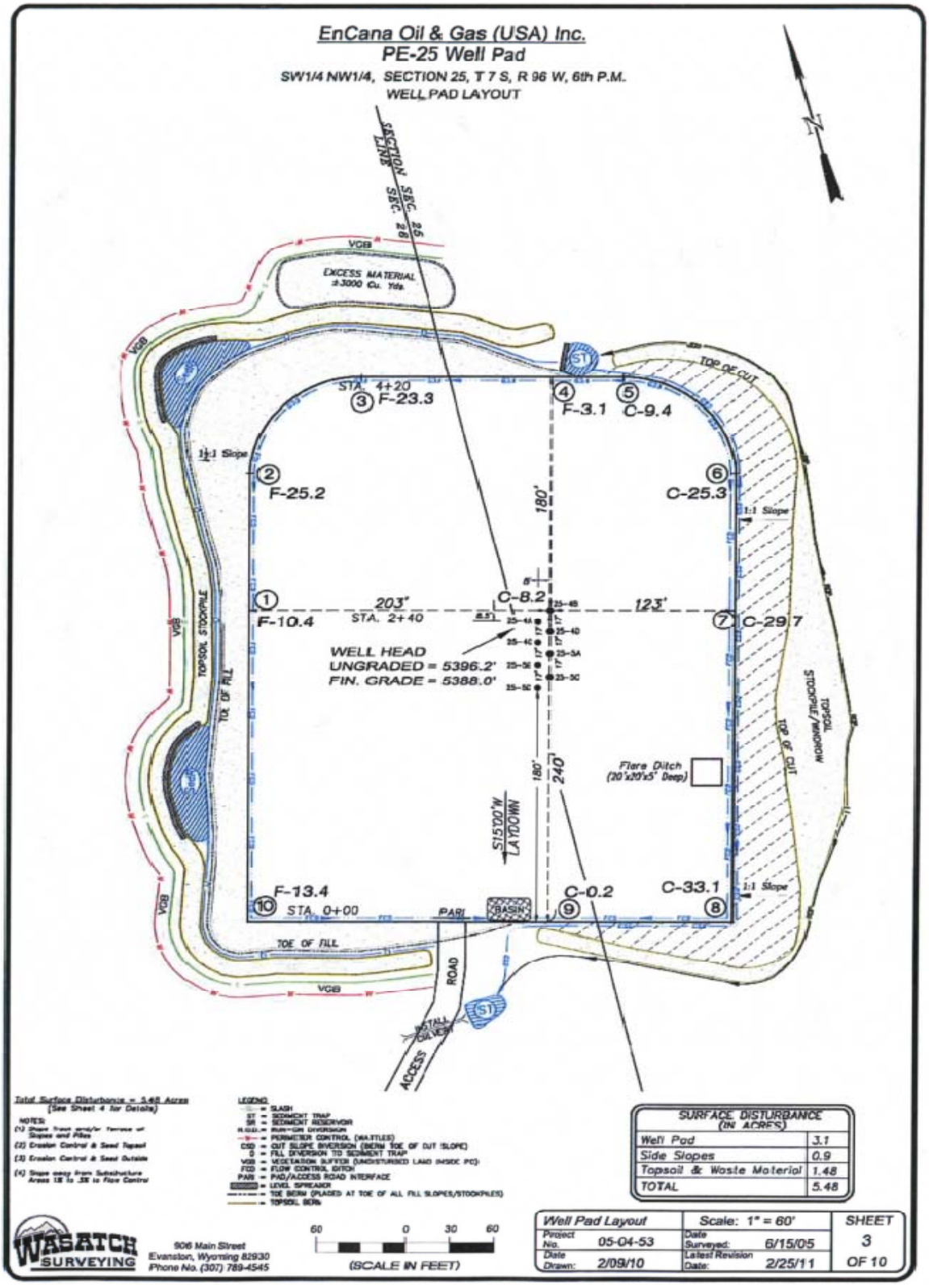

Figure 2. Construction Plat Survey

Trees cleared during road pioneering would be broken down and windrowed along the edge of the fillslope to serve as a storm water control or stored along selected areas of the alignment for later placement on reclaimed cut and fills. Cutslopes would be benched during construction to provide stability and layback the slope for better reclaim potential. Topsoil would be stripped along the cleared right-of-way and windrowed along the cut and fill sides of the roadway for later use in road reclamation. Curve widening and turnouts would be installed on switchbacks and appropriate curves to allow safe vehicle passage. The road would be surfaced with a minimum 6-inch layer of gravel. Culvert locations (shown on Figure 1) would be reviewed and finalized during the preconstruction meeting. The average disturbance width for the proposed road would be 40 feet. Total short-term disturbance associated with road construction would amount to 1.9 acres. The long-term disturbance (essentially the 20-foot-wide road travelway including the road ditches) would be 1.0 acre.

From a working area established on or near the existing PK25 pad on High Mesa, the proposed 6-inch steel surface pipeline (Figure 3) would be welded in strings and fed downhill and cross-country through the juniper woodland forest. Two short sections (at top of the ridge and at the PE25 pad totaling about 500 feet) would be buried per conventional pipeline installation to help anchor the finished surface line at both ends. The surface portion of the pipeline (approximately 1,500 feet) would be strung downhill using a series of maneuvers. A heavy rope would be initially walked downhill through the trees along the planned pipeline alignment to the PE25 pad. A wire cable connected to the heavy rope would then be pulled downhill using a trackhoe staged on the PE25 pad. Last, the trackhoe would then pull the wire cable with the attached steel line downhill. A trackhoe and sideboom dozer would be staged at the top of the ridge to control the speed and overall safety of the line pulling. The extent of the damage from the surface line installation would be limited to individual trees and not result in surface disturbance. Additionally, a 6-inch surface poly water line would also be fed downhill off a spool from the PK25 pad that would supply treated water from the High Mesa Water Treatment Plant for drilling and completion work.

Safety protocols developed by Encana personnel for gas pipeline shut-off and blowdown by Encana personnel would be implemented in the event of a wildfire in the vicinity of the PE25 pipeline (Appendix B). Furthermore, Upper Colorado River Interagency Fire Management personnel would be notified of the location of the surface pipeline during its construction so that information can be shared within their wildland fire response protocols. The 500 feet of buried pipeline at top and bottom would create a 40-foot- wide disturbance resulting in 0.5 acre of disturbance.

Total surface disturbance on public land would be 7.9 acres short term and 2.5 acres long term. Table 2 summarizes short-term and long-term surface disturbance resulting on Federal lands.

Table 2: Disturbance Area (acres)

Component	***Federal Surface***	
	Short-term	***Long-term****
Pad	5.5	1.5
Road	1.9	1.0
Pipeline	0.5	N/A
Total	7.9 acres	2.5 acres

*Long-term disturbance figures are derived from the unreclaimed working area of the pad and the travel way area of the access road. Since the entire disturbed pipeline corridor is typically reclaimed, no long-term disturbance is associated with pipelines.

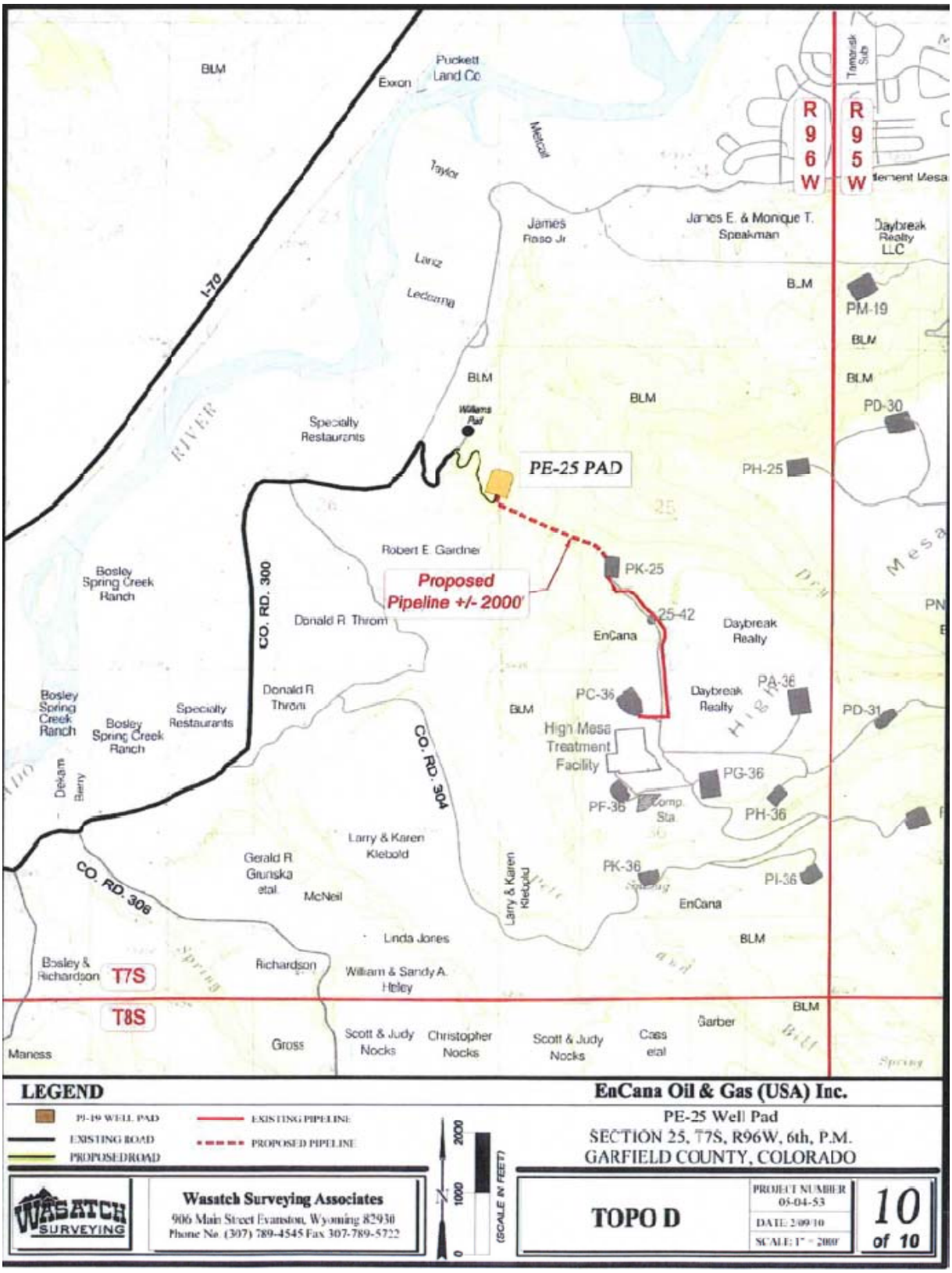

Figure 3. Proposed Surface Gas Pipeline Alignment

The Proposed Action would include drilling and completion operations, production of natural gas and associated liquid condensate, proper handling and disposal of produced water, and interim and final reclamation. The Proposed Action would be implemented consistent with Federal oil and gas lease, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs). In addition to the applicable SPGAP standard Surface-Use Conditions of Approval (COAs), Appendix D lists COAs that would be implemented as mitigation measures specific to this project. Furthermore, the operator would be required to abide by the terms and conditions identified in the BLM right-of-way for the access road, surface pipeline, and well pad. The operator would be responsible for periodic inspection and maintenance of the access road, pad, and pipeline.

NO ACTION ALTERNATIVE

The Proposed Action involves Federal subsurface minerals encumbered with Federal oil and gas leases that grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The No Action alternative constitutes denial of the APDs and denial of the BLM right-of-way associated with the Proposed Action.

Under the No Action alternative, none of the proposed developments described in the Proposed Action would take place.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal leases COC27825 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

SUMMARY OF LEASE STIPULATIONS

Table 3 lists the lease stipulations applicable to the eight wells, the eastern portion of the well pad, and the surface pipeline since those actions would occur on BLM Lease COC27825. These protective stipulations are in addition to standard or site-specific Conditions of Approval (COAs) presented in Appendix A. Although Williams holds the Federal lease in the E½NE¼ Section 26, the stipulations on that lease are worth reviewing to help establish the terms and conditions of the BLM right-of-way needed to authorize Encana to construct the PE25 access road and occupy the western portion of the pad.

The following stipulations and lease notices are attached all lands on Federal lease COC59137:

> To protect big game winter range including critical winter habitat and other definable winter range, no surface use is allowed within the legal boundaries of the lease during the December 1 through April 30 period. This stipulation does not apply to the operation and maintenance of production facilities.
>
> To protect plants and animals, riparian values, waterfowl production areas, and the sensitive resource values of the Lower Colorado River Area of Critical Environmental Concern (ACEC), no surface occupancy (NSO) or use is allowed within one-half mile of the high water mark on either side of the river. Upon review, it was determined that the proposed development is not located near any of the BLM parcels that comprise the ACEC (the closest parcel is located approximately 3.25 miles southwest of the pad). Furthermore, the Proposed Action does not lie within habitat typical of the Colorado River corridor.

Special biological and/or botanical inventories and special mitigation measures to reduce impacts of surface disturbance to sensitive plant and animal species may be required.

Table 3. Lease Stipulations Applicable to the Proposed Action

Lease Number	*Description of Applicable Lands*	*Lease Stipulations*
COC27825 (1979)	T.7S., R. 96W., Section 25: N½ 320 acres	**Timing Limitation:** No exploration, drilling or development activity from 1/1 to 5/31 to protect wildlife habitat. **Timing Limitation:** No exploration, drilling, or development activity within 0.25 mile of active raptor nest (4/1 to 8/31). Limitations do not apply to maintenance and operation of producing wells. Exceptions may be granted. **Surface Disturbance:** The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes, or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.

Although Williams holds the Federal lease in the E½NE¼ Section 26, the stipulations on that lease are worth reviewing to help establish the terms and conditions of the BLM right-of-way needed to authorize Encana to construct the PE25 access road and occupy the western portion of the pad.

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PLAN CONFORMANCE REVIEW

The Proposed Action and No Action alternative are subject to and have been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: The current land use plan is the *Glenwood Springs Resource Management Plan* (RMP), approved in 1984 and revised in 1988 (BLM 1984). Relevant amendments include the *Oil and Gas Plan Amendment to the Glenwood Springs Resource Management Plan* (BLM 1991) and the *Oil &Gas Leasing & Development Record of Decision and Resource Management Plan Amendment (*BLM 1999a).

Decision Language: The 1991 Oil and Gas Plan Amendment (BLM 1991) included the following at page 3: "697,720 acres of BLM-administered mineral estate within the Glenwood Springs Resource Area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations" (BLM 1991, page 3). This decision was carried forward unchanged in the 1999 ROD and RMP amendment at page 15 (BLM 1999b): "In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) [currently referred to as a Master Development Plan, MDP] that describes a minimum of 2 to 3 years of activity for operator controlled leases within a reasonable geographic area."

Discussion: The Proposed Action is in conformance with the 1991 and 1999 RMP amendments cited above because the Federal mineral estate proposed for development is open to oil and gas leasing and development. The 1999 RMP amendment requires multi-year development plans known at that time as Geographic Area Plans (GAPs) for lease development over a large geographic area. However, the 1999 RMP amendment also provides exceptions to that requirement for individual or small groups of exploratory wells drilled in relatively undrilled areas outside known high production areas. Therefore, the Proposed Action is in conformance with the exception to the requirement for operators to submit Master Development Plans (MDPs), previously known as Geographic Area Plans (GAPs).

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The environmental analysis must address whether impacts resulting from the Proposed Action or alternatives being analyzed would maintain, improve, or deteriorate land health conditions relative to these resources

These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The Proposed Action would be located in an area that was included in the Battlement Mesa LHA (BLM 2000).

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

During its internal scoping process for this Environmental Assessment (EA), pursuant to the National Environmental Policy Act (NEPA), BLM resource specialists identified the elements of the natural and human environment listed below as present in the project vicinity and potentially affected by the project.

The following subsections describe these environmental elements in the project area and summarize BLM's analysis of potential impacts resulting from implementation the Proposed Action.

Access and Transportation
Air Quality
Cultural Resources
Fossil Resources
Geology and Minerals
Invasive Non-Native Plants
Migratory Birds
Native American Religious Concerns
Noise
Range Management
Realty Authorizations
Socio-Economics
Soils
Special Status Species
Vegetation
Visual Resources
Wastes, Hazardous and Solid
Water Quality, Surface and Ground
Wildlife, Aquatic and Terrestrial

Access and Transportation

Affected Environment

The proposed project area is accessed by exiting Interstate 70 (Exit 75) at Parachute, traveling west along the I-70 frontage road (U.S. Highway 6 and 24) to the Una Bridge, crossing the Colorado River at the Una Bridge, and then traveling east toward Battlement Mesa via CR300 (Figure 1). Although not specifically noted on Figure 1, the access road to the proposed pad off CR300 presently serves the Williams SG41-26 pad.

Environmental Consequences

Proposed Action

The new PE25 road would be constructed with a beginning point of construction approximately 300 feet south of the SG41-26 pad entrance. Encana would arrange a cooperative road use and maintenance agreement with Williams Production for their use of the existing SG41-26 access road on public land. The public has legal access to public land along CR300, since the county road bisects the parcel. However, with the recent construction of the Williams' SG41-26 access road and pad, Williams will install a traffic control gate near the junction with CR300 to curtail public motorized access on the existing well pad access road. This gate would also effectively control vehicle access to the proposed PE25 pad as well.

Constructing the 0.4-mile of new access road with a 40-foot-wide disturbance corridor would create 1.9 acres of new surface disturbance. After reclamation of the road cuts and fills, the long-term disturbance for the new road would total 1.0 acres (Table 2).

Table 4. Traffic Associated with Drilling and Completion Activities

Vehicle Class	*Number of trips per well*	*Percent of total*
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%

Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.

The Proposed Action would result in a substantial increase in truck traffic. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 4). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities, and hauling produced water and condensate. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately 7 days.

Degradation of field development roads may occur due to heavy equipment travel and fugitive dust and noise would be created. Mitigation measures (Appendix A) would be required as conditions of approval to ensure adequate dust abatement and road maintenance occur.

No Action Alternative

This alternative would not have an impact on access or transportation, because the development activities would not occur.

Air Quality

Affected Environment

Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants in areas of public use. Although specific air quality monitoring has not been conducted within the project area, regional air quality monitoring has been conducted in Rifle and elsewhere in Garfield County. Air pollutants measured in the region for which ambient air quality standards exist include: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (μ) in diameter (PM_{10}) and less than 2.5 μ in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards. As shown in Table 5, regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants.

Federal air quality regulations are enforced by the CDPHE. The Prevention of Significant Deterioration (PSD) Program within CDPHE is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area's air quality classification. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict.

The surrounding areas are classified as PSD Class II. The PSD Class I areas within 100 miles of the project area are the Flat Tops Wilderness (45 miles NE), Maroon Bells–Snowmass Wilderness (50 miles SE), West Elk Wilderness (60 miles SE), Black Canyon of the Gunnison National Park (45 miles S), Eagles Nest Wilderness (90 miles E), and Arches National Park (65 miles SW). Dinosaur National Monument (55 miles NW) is listed as a Federal Class II area, but is regulated as a Class I area for SO_2 by CDPHE. These sensitive areas have the potential to be impacted by cumulative project source emissions. Regional background pollutant concentrations and NAAQS, CAAQS, and PSD Class I and II increments are also presented in Table 5.

Environmental Consequences

Proposed Action

CDPHE, under its EPA-approved State Implementation Plan (SIP), is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made; those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. Therefore, CDPHE has the ultimate responsibility for reviewing and permitting any project's air quality impacts prior to its operation. Unlike the conceptual "reasonable but conservative" engineering designs used in NEPA analyses, any CDPHE air quality preconstruction permitting required would be based on site-specific, detailed engineering values, which would be assessed in CDPHE's review of the permit application.

Air quality would decrease temporarily during construction of the PE25 road, pad, wells, and pipelines. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activities would occur between 7:00 a.m. and 6:00 p.m. each day for a period of approximately two weeks. Construction of the road would take 1 to 2 weeks, pad construction 1 to 2 weeks, and pipeline installation an additional 2 days; much of this construction would occur concurrently. Once construction activities are complete, air quality impacts associated with these activities would also cease.

Table 5. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration (PSD Increments)

Pollutant/Averaging Time		***Measured Background Concentration***	***Colorado and/or National AAQS***	***Incremental Increase Above Legal Baseline PSD Class I/ II***	
Carbon Monoxide (CO) [1]	1-hour 8-hour	1,160 µg/m^3 1,160 µg/m^3	40,000 µg/m^3 (35 ppm) 10,000 µg/m^3 (9 ppm)	n/a n/a	n/a n/a
Nitrogen Dioxide (NO_2) [2]	Annual	10 µg/m^3	100 µg/m^3 (0.053 ppm)	2.5 µg/m^3	25 µg/m^3
Ozone[3]	8-hour	149 µg/m^3 (highest)	147 µg/m^3 (0.075 ppm)	n/a	n/a
Particulate Matter (PM_{10}) [1]	24-hour	114 µg/m^3 (highest)	150 µg/m^3	8 µg/m^3	30 µg/m^3
Particulate Matter ($PM_{2.5}$) [4]	24-hour Annual	40 µg/m^3 (highest) 11.2 µg/m^3	35 µg/m^3 15 µg/m^3	n/a n/a	n/a n/a
Sulfur Dioxide (SO_2) [5]	3-hour 24-hour Annual	24 µg/m^3 13 µg/m^3 5 µg/m^3	1,300 µg/m^3 (0.5 ppm) 365 µg/m^3 (0.14 ppm) 80 µg/m^3 (0.03 ppm)	25 µg/m^3 5 µg/m^3 2 µg/m^3	512 µg/m^3 91 µg/m^3 20 µg/m^3

[1] Background data collected in Rifle, 2008; highest levels recorded in April (Air Resource Specialists 2009).
[2] Background data collected by Encana at site north of Parachute, 2007 (CDPHE 2008).
[3] Background data collected in Rifle, 2008; highest levels recorded in July (Air Resource Specialists 2009).
[4] Background data collected in Rifle, September - December 2008; highest levels recorded in December (Air Resource Specialists 2009).
[5] Background data collected at Unocal site, 1983-1984 (CDPHE 2008).

Volatile organic compound (VOC) emissions are dependent on the characteristics of the condensate, tank operations, and production. The air impacts associated with the condensate tanks are anticipated to be minor, but VOC emissions would be controlled as required under CDPHE Regulation 7. If deemed necessary by the State, Encana may need to install a vapor recovery or thermal destruction system to reduce VOC concentrations.

The Roan Plateau RMPA/EIS describes potential effects from oil and gas development (BLM 2006: 4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for "criteria pollutants" (particulate matter [PM_{10} and $PM_{2.5}$], carbon monoxide, sulfur dioxide, and nitrogen oxides) and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes. Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA/EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a "just noticeable" impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness). For the other pollutants analyzed, the implementation of oil and gas development under the Roan Plateau RMPA/EIS would have no or negligible long-term adverse impacts on air quality.

Two aspects of BLM's use of the air modeling for the Roan Plateau RMPA/EIS bear elaboration. First, with regard to wells located outside the Roan planning area, such as on Encana's proposed PE25 pad, BLM has determined that the entire CRVFO oil and gas development area along the I-70 corridor is within the same airshed and that pollutants emitted anywhere within that area have the same potential for far-field cumulative impacts as those emitted within the Roan Plateau planning area. Second, the number of APDs approved by BLM as of the date of this EA is below the total number analyzed in the Roan Plateau RMPA/EIS. Consequently, the Proposed Action is within the scope of the reasonable foreseeable development (RFD) scenario analyzed in that document. When the number of wells analyzed for the Roan Plateau RMPA/EIS has been reached, the BLM will no longer approve new APDs by reference to the Roan modeling. Instead, the BLM anticipates requiring project-specific modeling of air quality impacts or, when it becomes available, using the new air modeling conducted for the RMP revision currently underway as the basis for analyzing project-related air impacts.

Activities described in the Proposed Action would result in localized short-term increases in exhaust emissions from vehicles and drilling equipment and fugitive dust from construction and use of the well pad and access road. Concentrations would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA/EIS. However, it is anticipated that construction, drilling, and production activities could produce high levels of fugitive dust in dry conditions without dust abatement. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by the Authorized Officer (Appendix A). Additionally, the operator would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

Since the current land use plan was approved, ongoing scientific research has identified the potential impacts of "greenhouse gases" (GHGs) and their effects on global atmospheric conditions. These GHGs include carbon dioxide, methane, nitrous oxide, water vapor, and several trace gases. Through complex interactions on a global scale, these GHG emissions are believed by many experts to cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2007) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. In 2007, the IPCC also concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (man-made) greenhouse gas concentrations" (National Academy of Sciences 2007). Other theories about the effect of GHGs on global climate change exist.

The assessment of GHG emissions and climate change remains in its formative phase. Therefore, it is not yet possible to know with certainty the net impact to climate from GHGs produced globally over the last century or from those produced today. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts of climate change on the specific area of the Proposed Action. In addition, while any oil and gas leasing or development projects may contribute GHGs to the atmosphere, these contributions would not have a significant effect on a phenomenon occurring at the global scale believed by some to be due to more than a century of human activities.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, emissions of pollutants from vehicle and equipment engines or of fugitive dust from disturbed surfaces that would accompany the Proposed Action would not occur.

Cultural Resources

Affected Environment

Four Class III cultural resource investigations (intensive pedestrian inventories) identified as GSFO# 1110-9, 5409-8, 1107-23, and 1106-7 have been conducted in the proposed PE25 pad project area. Although seven prehistoric Isolated Finds and one prehistoric lithic scatter were identified during these inventories, none are considered "historic properties." "Historic properties" are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Properties (NRHP).

Environmental Consequences

Proposed Action

The implementation of the Proposed Action would have no direct impacts to known "historic properties" as none were discovered during cultural inventories. Therefore, the BLM made a determination of "**No Historic Properties Affected**." This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (16 USC 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. Therefore, no formal consultation was initiated with the SHPO.

Indirect, long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the location. These impacts could range from illegal collection and excavation to vandalism. A standard Education/Discovery COA for cultural resource protection would be attached to the APD(s) (Appendix A). The importance of this COA should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction, drilling, completion, and maintenance operations.

No Action Alternative

The No Action alternative constitutes denial of the APDs and the BLM right-of-way associated with the Proposed Action. Under this alternative, none of the impacts of the Proposed Action would occur.

Fossil Resources

Affected Environment

Scientifically important vertebrate fossils are known to occur in the Wasatch Formation within SPGAP project area. The Paleocene-Eocene Wasatch Formation includes mammals, birds, reptiles, fish, freshwater clams and snails, and plants. Important invertebrate fossils are known from the Parachute Creek member of the Green River Formation. The Eocene Green River Formation includes fossil insects (over 100 species), as well as plants, gar and other fish, turtles and crocodilians.

Environmental Consequences

Proposed Action

Construction of oil and gas facilities, including access roads and well pads, could adversely affect scientifically important fossils. Both surface and subsurface fossils could be damaged or destroyed. The greatest potential for impacts is associated with excavations of surface sediments and shallow bedrock. Results of a review of USGS geologic map and topographic quadrangles and aerial photos indicate that the project area is heavily vegetated and covered with thick soil deposits. In addition, an examination of the BLM paleontology database and consultation with the BLM Regional Paleontologist indicate that there are no known fossil deposits in the SPGAP area. It is unlikely that a field survey would provide additional information unless outcrops free of soil and vegetation could be identified. However, in the event that paleontological resources are encountered, a standard paleontological condition of approval would be attached to the APDs.

No Action Alternative

Under the No Action alternative, no impacts to fossil resources would occur.

Geology and Minerals

Affected Environment

The project area is located within the southern edge of the Piceance Basin on the northern side of Battlement Mesa. Battlement Mesa is a large, prominent highland that stretches for approximately 20 miles east-west along the Garfield-Mesa county line. It is visible similar in geology to the nearby Grand Mesa to the southwest, consisting largely of basalt-capped sedimentary rocks of the Green River and Uinta Formations. Table 6 lists the formations that crop out along or near the project site.

Table 6. Surficial Geologic Formations in the Study Area

Map Symbol	***Formation Name***	***Age***	***Characteristics***	***Location***
Qga	Alluvium	Holocene	Pebble, cobble, and boulder gravel.	Alluvial fans and terraces
Qop	Pediment gravel deposits	Pleistocene	Gravels composed of eroded basalt boulders.	North slopes / flanks of Battlement Mesa.
Tws	Shire Member of the Wasatch Formation	Eocene	Purple, lavender, red, gray, and brown claystone.	Prominent exposures surrounding site.

Source: Donnell et al. (1986)

The Cretaceous-age Mesaverde Group is the target zone of the proposed drilling program. Comprising the Iles and Williams Fork Formations, the Mesaverde Group is composed of marine sandstones transitional to non-marine beds of coal, shale, and sandstone that were deposited marginal to the great Cretaceous seaway (Warner 1964) that occupied much of the Western Interior region during that time. The oscillating shoreline of this sea, due to the rise and fall of sea level, left behind a complex of transgressive and regressive sedimentary sequences of onshore, nearshore, and offshore sediments.

The orogenic (mountain-building) processes that also took place during the late Cretaceous produced uplift and subsidence structures in central and eastern Utah, western Colorado, and most of Wyoming (Utah Geological Society 2009). As the highland areas were exposed to erosion and the basin deepened, a greater amount of sediment was available for deposition along the ancient shoreline. The subsequent facies (textural) changes that occurred as a result of these two processes are believed to be the trapping mechanism that defines the extensive gas accumulation of the Williams Fork Formation. The source rocks are interbedded and thermally mature gas-prone shales, mudstones, siltstones, and coals. The reservoir rocks are fine- to medium-grained sandstones, varying in thickness from less than 10 feet to more than 50 feet (Spencer 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the tight gas is both stratigraphic and diagenetic (post-depositional).

Production is derived from three reservoir intervals, which include the Wasatch Formation, the Williams Fork Formation, and Iles Formation. The latter two make up the Upper Cretaceous Mesaverde Group. Mesaverde Group reservoirs are tight throughout most of the Piceance Basin, and generally become tighter with depth of burial (Spencer 1988). Substantial reserves have been known since the late 1950s to be trapped within the tight sands of these reservoirs. However, only within the last decade, and particularly within the last few years, has the integrated application of new technologies turned the tight gas sands into a profitable play (Kuuskraa 1997). Natural fracture detection, advanced log analysis, more rigorous well completions and recompletions, and denser spacing have increased the amount of recoverable gas within these reservoirs.

Environmental Consequences

Proposed Action

Implementation of the proposed development program would result in natural gas and associated water being produced from the tight gas sands of the Mesaverde Group. The amount of natural gas that may be potentially produced can only be estimated based on production rates from nearby wells and adjacent fields. Reserves have been estimated to approach 2 billion cubic feet (bcf) of natural gas per well (Vargas 2006). If the wells become productive, initial production rates would be expected to be highest during the first few years of production, then steadily decline during the remainder of the economic lives of the wells. Most of the wells currently in production are estimated to have a life span of 30 to 35 years. See the section on Surface Water for requirements regarding disposal of produced water.

Specific casing depths would vary depending on well location and drilling conditions. Surface casing used to protect and isolate usable water and potential production zones would be set at depths substantially below known aquifers within the area. If a water-bearing, gas-producing, lost-circulation, or pressurized zone is encountered below the surface casing, cement volumes would be adjusted to protect and further isolate those zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or drilling fluids from reaching usable water- or gas-producing zones within the wellbore.

No Action Alternative

Under the No Action alternative, drilling and completion of the Federal wells would not take place.

Invasive Non-Native Plants

Affected Environment

The proposed road alignment would be constructed in a pinyon-juniper woodland. Cheatgrass (*Anisantha tectorum*) is abundant throughout the understory. The proposed pad would occur in a shrubland dominated by Wyoming big sagebrush (*Artemisia tridentata* subsp. *wyomingensis*), within which cheatgrass is common but not the dominant understory species. A non-native annual forb, tall tumble-mustard (*Sisymbrium altissimum*), is scattered throughout the sagebrush shrubland.

Environmental Consequences

Proposed Action

Surface-disturbing activities provide a niche for the invasion and establishment of invasive non-native species, particularly when these species are already present in the surrounding area. Because a variety of invasive, non-native species are already present in the project area, the potential for weed invasion following construction activities is high. Mitigation measures designed to minimize the spread of these species are presented in Appendix A.

No Action Alternative

Under the No Action alternative, no new construction would take place; therefore, no new infestations of invasive, non-native species should occur. However, existing infestations could spread if left untreated.

Migratory Birds

Affected Environment

The Migratory Bird Treaty Act (MBTA) includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. For most migrant and native resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. In addition, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

The composition of vegetation at the site includes a big sagebrush shrubland in the area of the proposed pad and a juniper-dominated woodland along the proposed access road. Understory shrub species including sagebrush and greasewood are present on deeper soils on isolated benches in the area. Pinyon pine is scattered and only a few small trees were observed in the project area. Most of the juniper woodland consists of mature trees; however, large trees greater than 30 feet tall are not common. Much of the understory vegetation is sparse due to the dense juniper and thin, rocky soil (WWE 2007).

Vegetation in the project area provides cover, forage, and nesting habitat for a variety of migratory birds. A few species included on the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2008) are potentially present in the project vicinity. These species are the pinyon jay (*Gymnorhinus cyanocephalus*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), and Virginia's warbler (*Oreothlypis virginiae*) in pinyon-juniper woodlands and the Brewer's sparrow (*Spizella breweri*) in sagebrush shrublands. Other species that are not on the BCC list but associated primarily with these habitat types include the Say's phoebe (*Sayornis saya*), plumbeous vireo (*Vireo plumbeus*), juniper titmouse (*Baeolophus griseus*), Townsend's solitaire (*Myadestes townsendi*), American robin (*Turdus migratorius*), mountain bluebird (*Sialia sialis*), and blue-gray gnatcatcher (*Polioptila caerulea*) in juniper woodlands and the western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), lark sparrow (Chondestes grammacus), and vesper sparrow (*Pooecetes gramineus*) in sagebrush shrublands.

During a survey for birds of prey in April 2011, no raptor nests were found. However, raptors likely to use the area for hunting include the American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and Swainson's hawk (*B. swainsoni*) throughout the area; the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperi*), and great horned owl (*Bubo virginiana*) in juniper woodlands; and the northern harrier (*Circus cyaneus*) in sagebrush shrublands.

Environmental Consequences

Proposed Action

Direct impacts to migratory birds from the Proposed Action include the loss/fragmentation of approximately 7.9 acres of foraging/hunting and nesting habitat.

Removal of juniper woodland vegetation would result in a loss of existing and potential nesting sites. Loss of habitat and impacts on populations would be more severe for BCC or other high-priority species. Reclamation activities resulting in the growth of herbaceous species would increase habitat for small rodents, and therefore, increase prey species for raptors. While habitat loss and fragmentation may affect individual birds, it is not expected to adversely impact a species as a whole.

If construction, drilling, or completion activities occur during the spring/summer nesting season, visual and noise disturbance near active nests could cause nest failure or abandonment and reduced productivity. Construction activity during the nesting season could also result in the direct destruction of clutches and/or mortality of nestlings/fledglings. A standard COA (Appendix A) would prohibit initiation of ground-disturbing activities or vegetation removal from May 1 to June 30.

The operator remains subject to the MBTA, administered by the USFWS, which precludes the "take" of any raptor or most other native species. The MBTA prohibits the "take" of a protected species. Under the Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets "harm" and "kill" to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

No Action Alternative

Under the No Action Alternative, any action requiring Federal approval would be denied and there would be no new surface disturbance. This would eliminate new impacts to Migratory Birds.

Native American Religious Concerns

Affected Environment

The proposed PE25 pad is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see section on Cultural Resources) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. No sensitive areas were identified during the inventories, nor are any currently known in the proposed project area.

Environmental Consequences

Proposed Action

At present, no Native American concerns are known within the project area and none were identified during the inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the CRVFO, have indicated that they do not wish to be consulted for small projects or projects where no Native American areas of concern have been identified either through survey or past consultations. Therefore, formal consultation was not undertaken. If new data are disclosed, new terms and conditions may have to be negotiated to accommodate their concerns. Although the Proposed Action would have no direct impacts, increased access and personnel in the vicinity of the proposed project could indirectly impact unknown Native American resources ranging from illegal collection to vandalism.

The National Historic Preservation Act (NHPA) requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency Authorized Officer notified immediately (36 CFR 800.13). The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the agency Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act. Williams will notify its staff and contractors of the requirement under the NHPA, that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered. The proponent and contractors should also be aware of requirements under the NAGPRA.

No Action Alternative

The No Action alternative constitutes denial of the APDs and denial of the BLM right-of-way associated with the Proposed Action. Under the No Action alternative, none of the proposed developments described in the Proposed Action would take place.

Noise

Noise is generally described as unwanted sound, weighted and noise intensity (or loudness) is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, not linear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale to encompass all the sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10.

Sound levels have been calculated for areas that exhibit typical land uses and population densities. In rural recreational areas, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). As a basis for comparison, the noise level during normal conversation of two people 5 feet apart is 60 dBA.

Affected Environment

The Proposed Action would lie within a rural setting characterized by recent natural gas development activities. Noise levels in the area are presently created by traffic serving existing wells and ongoing drilling and completion, and well production activities. The proposed road and pads would be located at least 0.5 mile from the nearest residence.

Environmental Consequences

Proposed Action

The project would result in increased levels of noise during the construction, drilling, and completion phases. The noise would be most noticeable along the roads used to haul equipment and at the pad location. Drilling activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). Operations involving pipeline or gas facility installation or maintenance, compressors, the use of a drilling rig, completion rig, workover rig, or stimulation are subject to the maximum permissible noise levels for industrial zones. The 2006 revised COGCC noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with the maximum permissible levels at a distance of 350 feet (Table 7). Periodically the noise level may increase to 10 dBA above levels in Table 7 for no more than 15 minutes in one hour period. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Table 7. Noise Standards for Light industrial, Residential/Agriculture/Rural

Zone	***7:00 A.M. to 7:00 P.M***	***7:00 P.M. to 7:00 A.M***
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Short-term (7- to 14-day) increases in noise levels would characterize road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an average construction-site noise level of 67 dBA at 500 feet (Table 8), construction noise would equal approximately 59 dBA at 1,000 feet. At 1,000 feet, noise levels would approximate those of an active commercial area (EPA 1974).

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Based on a measured noise level of 68 dBA at 500 feet, actions associated with drilling and completion would generate approximately 62 dBA at 1,000 feet. This level of noise approximates that associated with light industrial activities (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area. As stated above, the nearest residence is 0.5 mile away.

Table 8. Noise Levels at Typical Construction Sites and along Access Roads			
Equipment	**Noise Level (dBA)**		
	50 feet	**500 feet**	**1,000 feet**
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

Traffic noise levels would also be elevated as a consequence of the Proposed Action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 8, approximately 68 dBA of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases. Noise impacts would decrease during the production phase. These levels would be less than during the construction phase but are expected to remain above background levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. Traffic noise level would impact residences located along county roads that provide primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no noise impacts would accompany this alternative.

Range Management

Affected Environment

The proposed wells would be located in the Dry Creek Pete & Bill Creek Allotment. Table 9 summarizes the permitted grazing use on the allotments.

Environmental Consequences

Proposed Action

Construction of the proposed wells, road, and pipeline would result in 7.9 acres of short-term surface disturbance and a loss of less than one AUM of available livestock forage. Rehabilitation of the disturbed

area would replace some of the livestock forage initially lost. It usually takes about 3 years for grasses and forbs to recover lost productivity following site rehabilitation in this area. Production of grasses and forbs on successfully rehabilitated sites is often greater then on those sites prior to disturbance, which would help mitigate some of the initial loss of forage.

Table 9. Grazing Allotments

Allotment	*Authorization Number*	*Number (Cattle)*	*Period of Use*	*Percent Public Land*	*Animal Unit Months (AUMs)*
08125 Dry Creek Pete & Bill	**0507564**	**36**	**5/1 – 6/15**	**100**	**54**
		21	**10/1-10/31**	**100**	**21**
	0507593	**118**	**5/1 – 6/15**	**100**	**178**
		118	**10/1 -10/31**	**100**	**1200**

The Proposed Action would result in a long-term loss of forage in disturbed areas that are needed for maintenance of gas production over the life of the wells. An increase in human activity related to development and maintenance of the Proposed Action would cause cattle to move away from where the activity is taking place. The long-term negative impacts that development of the proposed wells would have on grazing livestock would be expected to be minor.

Any range projects that are damaged or destroyed during development or maintenance will be repaired or replaced as soon as possible by the operator (Appendix A).

No Action Alternative

There would be no impacts to range resources because the developments described in the Proposed Action would not occur.

Realty Authorizations

Affected Environment

Aside from the Federal oil and gas lease (COC27825) listed in Table 3, no existing realty authorizations currently exist in the immediate vicinity of the project area. The Federal lease gives Encana the right to explore and develop the Federal fluid minerals. However, components of the Proposed Action would require Realty Authorizations (issuance of right-of-way grants) to Encana by the BLM. The nearby Williams SG41-26 access road and pad were authorized under lease operations (COC59137). Encana and Williams would have joint maintenance responsibilities along shared portions of the access road.

Environmental Consequences

Proposed Action

Since the access road would not be located on the Federal lease COC27825, Encana would be required to obtain the necessary ROWs. Standard reclamation measures (Appendix A) would be required for the pending BLM ROW for Encana to construct the new PE25 access road, pipeline, and pad. Potential impacts to Williams from Encana's use of the SG41-26 road would be mitigated based on a requirement

for written agreements between Encana and Williams covering road use and maintenance. Appendix A lists suggested terms and conditions for the proposed western half of the BLM pad, surface gas pipeline and access road right-of-way.

No Action Alternative

No new realty authorizations would be necessary under the No Action alternative.

Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County grew by an average of approximately 3% per year from 2000 to 2005, resulting in an increase from 44,236 to 50,379 residents (DOLA 2010). Population growth in Garfield County is expected to more than double over the next 20 years from over 50,000 in 2005 to 106,549 in 2025 (DOLA 2010).

In the year 2009, industry groups in Garfield County with the highest percentage of total employment were construction 15%, tourism 12%, retail trade 13%, and education and health 20 % (Colorado Department of Labor and Employment 2010). An estimated 13.3% of the population was retired in the year 2000 and did not earn wages (Garfield County 2000). Employment in agriculture, forestry, hunting, and mining accounted for 8% of total employment (Colorado Department of Labor and Employment 2010).

Personal income in Garfield County has also risen, growing from $504 million in 1990 to $2.2 billion in 2008 (U.S. Department of Commerce 2008). Annual per capita income has grown in the same period; from about $19,354 to $40,166 (U.S. Department of Commerce 2008), and the average earnings per job in 2005 was approximately $37,500 (Garfield County 2007). The communities of Parachute, Silt, and Rifle are considered the most affordable for housing; the communities of Battlement Mesa, New Castle, and Glenwood Springs the least affordable where the cost to rent or own similar housing may be 50% or more (BLM 2006).

Activities on public land in the vicinity of the project area are primarily ranching/farming, hunting, OHV travel, and the development of oil and gas resources. Hunters contribute to the economy because many require lodging, restaurants, sporting goods, guides and outfitting services, food, fuel, and other associated supplies. Big-game hunting, in particular, is viewed as critical to Garfield County, and especially the local community economies that depend on BLM and Forest Service public lands where most hunting occurs (BLM 2006). Expenditures by hunters in the Roan Plateau Planning Area have been estimated to be as much as $1 million annually, with perhaps an additional $1 million annually of indirect and local expenditures (CDOW 1995, cited in BLM 2006).

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (BLM 2006). Gas production in Garfield County has increased tremendously during the past nine years from 70,309,038 (MCF) in 2000 to 575,697,025 (MCF) in 2009 (COGCC 2010). In addition, Garfield County is experiencing the fastest oil and gas development in Colorado with over 2,000 drilling permits currently approved between July 2009 and September 2010 (COGCC 2010). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an

estimated 4,000 persons were directly employed by gas development companies and their subcontractors in Garfield County (Garfield County 2009).

The Federal government makes "Payments in Lieu of Taxes" (PILT) to County governments to help offset property tax revenue lost of nontaxable Federal lands within County boundaries (BLM 2006). Payments are based on Federal acreage in the County for all land management agencies, including BLM, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and National Park Service (NPS). The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT received by Garfield County in the last five years has been as follows: $808,348 in 2005; $1,065,158 in 2006; $1,078,087 in 2007; and $1,078,521 in 2008; $1,808,984 in 2009 (USDI 2010).

In addition to PILT payments, BLM shares revenue generated by commercial activities on public lands with State and County governments (BLM 2006). Federal mineral royalties are levied on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead value of oil and gas produced from public land. Half the royalty receipts are distributed to Colorado, and the amount distributed to Garfield County in 2002 attributable to oil and gas production was $14.1 million. In 2001, the amount was $5.5 million (BLM 2006). These funds are then allocated to fund County services, schools, and local communities.

Property tax revenue from oil and gas development has also become the largest source of public revenue in Garfield County (BLM 2006). In the year 2009, oil and gas assessed valuation in Garfield County amounted to approximately $3.8 billion, or about 74% of total assessed value. Total tax revenues from property taxes and special district levies were $130 million. Tax dollar distributions in 2009 were Schools 30.4%, County 32.3%, Special Districts 14.3%, Fire Districts 12.3%, Colleges 8.9%, and Towns 1.7% (Garfield County 2009).

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any "disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations." The Latino community is the only minority population of note in the vicinity of the project area. In 2000, 16.7% of the residents of Garfield County identified themselves as Hispanic or Latino, and this is consistent across the State (17.1%). African Americans, American Indians, and Pacific Islanders account for less than 1% of the Garfield County population, which is below the State levels (Garfield County 2000).

Environmental Consequences

Proposed Action

The Proposed Action would have minor positive impacts to local economies of Garfield County through the creation or retention of job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience a modest increase in tax and royalty revenues. Some minor economic loss to private landowners or guides may result from the potential displacement of big game and resulting reduction in big game hunting within the project area.

The Proposed Action could result in minor negative social impacts, including (1) a decrease in the recreational character of the area, reduced scenic quality, increased traffic volumes and increased dust levels, especially during construction. However, these impacts would be minor and limited to the relatively short duration of drilling and completion activities.

No Action Alternative

The No Action alternative would result in no additional impacts to socio-economics of the general area.

Soils (includes an analysis of Public Land Health Standard 1)

Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located on two soil complexes. The pad and most of the access road would be located on the Potts-Ildefonso complex. This deep, well-drained soil is found on mesas, alluvial fans, and sides of valleys at elevations from 5,000 to 6,500 feet and slopes of 12% to 25%. This soil is derived from sandstone, shale, or basalt, with small amounts of aeolian material. Surface runoff is medium, and erosion hazard is moderate. Primary uses for these soils are limited grazing and wildlife habitat.

The lower portion of the access road would be located on the Ildefonso stony loam unit. This deep, well-drained, hilly soil is also found on mesas, sides of valleys, and alluvial fans at elevations from 5,000 to 6,500 feet and on slopes of 25% to 45%. This soil is derived primarily from basalt and may contain a small amount of aeolian material at the top of the unit. Surface runoff for this soil is medium and erosion hazard is severe. Primary uses for this soil include grazing and wildlife habitat.

Environmental Consequences

Proposed Action

The Proposed Action would result in approximately 7.9 acres of short-term vegetation loss and soil disturbance, with a long-term loss of approximately 2.5 acres. In general, the area contains adequate vegetation buffers that would minimize the potential for sediment transport. However, construction activities would cause slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Potential for soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to drainages.

Most of the area to be disturbed consists of soils with moderate risk of erosion or slope instability. However, the lower segment of the access road would cross soil with severe erosion hazard, and within the road cut this slope may be steepened beyond 30%. Since the project area is also situated within 0.5 mile of the Colorado River, particular care should be taken at these locations during construction and reclamation to ensure that proper BMPs, including the COAs listed in Appendix A, are utilized to prevent erosion and slope instability due to construction activities.

No Action Alternative

The No Action alternative would have no bearing on Standard 1 because no development would occur.

Analysis on Public Land Health Standard 1 for Upland Soils

The Proposed Action with associated mitigation would not likely prevent Standard 1 from being achieved.

Special Status Species (includes an analysis on Public Land Health Standard 4)

Federally Listed, Proposed, or Candidate Plant Species

Affected Environment

According to the latest species list from the USFWS, the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Parachute beardtongue (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), Colorado hookless cactus (*Sclerocactus glaucus*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*).

Environmental Consequences

Proposed Action

Results of a plant survey in October 2009 indicated no habitat for Federally listed, proposed, or candidate plant species in the project area. Therefore, the project would have "**No Effect**" on these species.

No Action Alternative

Because of the lack of potential habitat for any Federally listed, proposed, or candidate plant species in the project area, no impacts to these species would result from implementation of the No Action alternative.

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

Eight species of Federally listed, proposed, or candidate threatened or endangered vertebrate species occur within Garfield County or may affected by projects within the County. These species, their status, and their distributions and habitat associations in the region are summarized below:

Canada Lynx (*Lynx canadensis*). Federally listed as threatened. Canada lynx occupy high-latitude or high-elevation coniferous forests characterized by cold, snowy winters and an adequate prey base (Ruggiero et al. 1999). The preferred prey of Canada lynx throughout their range is the snowshoe hare (*Lepus americanus*). In the western United States, lynx are associated with mesic forests of lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen in the upper montane and subalpine zones, generally between 8,000 and 12,000 feet in elevation. Although snowshoe hares are the preferred prey in Colorado, lynx in also feed on other species such as the mountain cottontail (*Sylvilagus nuttallii*), pine squirrel (*Tamiasciurus hudsonicus*), and dusky grouse (*Dendragapus obscurus*). The U.S. Forest Service (USFS) has mapped suitable denning, winter, and other habitat for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the GSFO. The mapped suitable habitat in the WRNF comprises several areas known as Lynx Analysis Units (LAUs). Several LAUs border BLM lands along the I-70 corridor from east of Wolcott to west of DeBeque. While BLM lands within the GSFO area are generally not suitable habitat, they may support movement by animals dispersing to a new area or, potentially, moving to lower elevations during severe winter weather in search of prey. The project area does not border the Battlement Creek LAU and therefore will not be considered further in this document.

Mexican Spotted Owl (*Strix occidentalis*). Federally listed as threatened. This large owl nests, roosts, and hunts in mature coniferous forests in canyons and foothills. The only extant populations in Colorado are in the Pikes Peak and Wet Mountain areas of south-central Colorado and the Mesa Verde area of

southwestern Colorado. Because no known occurrences or suitable habitats are present in the project vicinity, this species is not considered further.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*). Candidate for Federal listing. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Riparian areas in the project area do not provide suitable habitat for this species. It also is not known to occur in the cottonwood corridor along the Colorado River a few miles north of the project area; occurrence there is unlikely due to the patchy nature of the stands and the general lack of a tall-shrub understory. Because no known occurrences or suitable habitats are present in the project vicinity, this species is not considered further.

Razorback Sucker (*Xyrauchen texanus*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), and Bonytail (*G. elegans*). Federally listed as endangered. These four species of Federally listed big-river fishes occur within the Colorado River drainage basin near or downstream from the project area. Designated Critical Habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. This portion of the Colorado River lies a few miles north of the project area. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 70 miles downstream from the project area. Occasionally, the bonytail is in Colorado west of Grand Junction, but its range does not extend east from that point. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known to exist in Colorado.

Greenback Cutthroat Trout (*Oncorhynchus clarki stomias*). Federally listed as threatened. The greenback cutthroat trout was not identified on the USFWS list for Garfield County; however, recent surveys have identified a population in Cache Creek, located several drainages east of the project area. The greenback is the subspecies of cutthroat trout native to the Platte River drainage on the Eastern Slope of Colorado, while the Colorado River cutthroat trout (*O. m. pleuriticus*) is the subspecies native to Garfield County and throughout the Western Slope of Colorado. Although the occurrence of greenbacks in Cache Creek and potentially elsewhere in the GSFO and WRNF areas is apparently the result of human intervention (e.g., sanctioned or *ad hoc* transplantation of fish from the Eastern Slope), its status as threatened applies to Western Slope populations. However, because drainages within the project area do not support this species, it is not considered further.

Environmental Consequences

Proposed Action

The Canada lynx, Mexican spotted owl, and western yellow-billed cuckoo are not expected to occur in the project vicinity based on habitat types present and documented occurrences. Therefore, the Proposed Action would have "**No Effect**" on these species.

For the four Federally listed big-river fishes, BLM prepared a Programmatic Biological Assessment (PBA) in 2008 addressing water-depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado. In response to this PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008. The PBO concurred with BLM's effects determination of "**May Affect, Likely to Adversely Affect**" the Colorado pikeminnow, bonytail, humpback chub, or razorback sucker as a result of depletions associated with oil and gas projects. To offset the impacts, the BLM has set up a Recovery Agreement, which includes a one-time fee per well to use for site-specific mitigation projects. These funds are used to contribute to the recovery of endangered fish through the restoration of habitat, propagation, and genetics management, instream

flow identification and protection, program management, non-native fish management, research and monitoring, and public education.

Other potential impacts to these species include inflow of sediments from areas of surface disturbance and inflow of chemical pollutants related to oil and gas activities on the well pads, associated with ancillary surface facilities, or resulting from an accident involving a haul truck in proximity to a stream. Stormwater controls required for the protection of surface water quality would also apply to the protection of aquatic organisms (see COAs in Appendix A). Even if sediment inflow were to occur, including incidental aerial deposition of fugitive dust from roadways and construction areas, these fishes are adapted to the naturally high sediment loads that characterize the Colorado River and its tributaries. Inflow of chemical pollutants is a very infrequent event due to the various design requirements imposed by BLM and the COGCC. However, in the event of a spill or accidental release, the operator is required to implement its Spill Prevention, Control, and Countermeasure (SPCC) plan, including such cleanup and mitigation measures as required by BLM or the State.

No Action Alternative

Under the No Action Alternative, any action requiring Federal approval would be denied and there would be no new surface disturbance. This would eliminate new impacts to Federally listed, proposed, or candidate fish and wildlife species.

BLM Sensitive Plant Species

Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in Garfield County include DeBeque milkvetch (*Astragalus debequaeus)*, Naturita milkvetch (*Astragalus naturitensis)*, Piceance bladderpod (*Lesquerella parviflora*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Harrington's penstemon (*Penstemon harringtonii*), and Cathedral Bluffs meadow-rue (*Thalictrum heliophilum*).

Environmental Consequences

Proposed Action

The results of an October 2009 plant inventory indicate no BLM sensitive plant species or their habitats in the vicinity of the Proposed Action. Harrington's penstemon is generally found in open sagebrush habitats between the elevations of 6,200 feet and 9,200 feet. This species is known to occur several miles to the east of the project area near Spruce Gulch; however, the elevation of the project area (5,200 feet) is below the elevational range of Harrington's penstemon.

No Action Alternative

Since no BLM sensitive plant species occur in the project area, no impacts to these species are expected.

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 10.

Table 10. Special-Status Wildlife Species Present or Potentially Present in the Project Area		
Common Name	***Habitat***	***Potential for Occurrence***
Fringed myotis, Townsend's big-eared bat	Breed and roost in caves, trees, mines, and buildings; hunt over pinyon-juniper, montane conifers, and semi-desert shrubs.	Possible
Northern goshawk	Predominantly uses spruce/fir forests but also use Douglas-fir, various pines, and aspens.	Unlikely
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's sparrow	Sagebrush shrublands, typically more extensive stands than in the project area.	Possible – Habitat Marginal
Midget faded rattlesnake	Cold desert dominated by sagebrush with abundant rock outcrops and ledges, typically farther west than the project area.	Unlikely
Great Basin spadefoot	Habitat includes pinyon-juniper woodlands and semi-desert shrublands, typically farther west than the project area.	Unlikely
Northern leopard frog	Wet meadows and the shallows of marshes, glacial kettles, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Possible – Habitat Marginal
Colorado River cutthroat trout	Restricted to small headwaters streams isolated from introductions or colonization by non-native trouts.	Not present
Flannelmouth sucker, bluehead sucker, roundtail chub	Flannelmouth sucker and roundtail chub generally restricted to rivers and major tributaries. Bluehead sucker also in smaller streams. No habitat for these species within the project vicinity.	Present in Colorado River

Environmental Consequences

Proposed Action

Fringed Myotis (*Myotis thysanodes* and Townsend's Big-eared Bat (*Corynorhinus townsendii*) – No caves or other suitable roosting sites occur in the project area. Loss of large trees, potentially also used for roosting, would be negligible, as would loss of hunting habitat, including the sagebrush shrublands as well as juniper woodlands. Temporary avoidance by bats of areas of nighttime drilling or completion activities would be unlikely to affect population sizes and reproductive success.

Northern Goshawk (*Accipiter gentilis*) – This species is mostly limited to spruce/fir or aspen forests, such as atop the Roan Plateau, Battlement Mesa, and other areas that reach subalpine elevations. However, goshawks may migrate to lower elevation pinyon/juniper or Douglas-fir habitats during winter and therefore could make occasional, transitory use of the project area for winter foraging. Goshawks feed primarily on small birds but also on diurnal small mammals (rabbits, chipmunks, etc.).

Brewer's Sparrow (*Spizella breweri*) – This project vicinity contains limited and marginal habitat for the Brewer's sparrow, which generally is restricted to relatively extensive, uniform stands of sagebrush, primarily sagebrush steppe. If the species were to occur, oil and gas activities occurring with the home range of a nesting pair could cause individuals to shift their feeding patterns and to locate their nests to avoid the disturbance (noise, dust, human activity). However, this impact would be limited to the nesting season and would not be an issue for long-term production and maintenance operations.

Great Basin Spadefoot (*Spea intermontana*) – This species generally inhabits seasonal pools and ponds in pinyon-juniper woodland, sagebrush, and semi-desert shrubland habitats, mostly below 6,000 feet in elevation. The project vicinity is of marginal suitability for this species, and spadefoots have not been discovered in the area.

Northern Leopard Frog (*Rana pipiens*) – Unlike the spadefoot, the northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. This species requires streams with good water quality and abundant aquatic or shoreline vegetation. No suitable habitat would be directly affected by the project

Midget Faded Rattlesnake (*Crotalus viridis concolor*) – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northeastern Utah, and northwestern Colorado, including western Garfield County. Suitable habitats include sandy and rocky areas in pinyon-juniper and semi-desert shrub. The relatively densely vegetated and generally north-facing aspects of the plan area are less suitable than the more barren south-facing areas north of I-70. The potential for occurrence in the project vicinity is very low.

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – Remaining populations of this subspecies of cutthroat trout occur mostly in headwater streams and lakes of the Colorado River drainage. Because no perennial streams would be affected by the project area, impacts to the Colorado River cutthroat trout would not be expected.

Flannelmouth Sucker (*Catostomus latipinnis*), Bluehead Sucker (*C. discobolus*), and Roundtail Chub (*Gila robusta*) – As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker, bluehead sucker, and roundtail chub are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River, in the unlikely event that this were to occur as a result of the project. Protective COAs for water quality (Appendix A) would also minimize this potential for flow of chemical pollutants into area streams. Also similarly to the endangered big-river fishes, these species are vulnerable to alterations in flow regimes in the Colorado River that affect the presence of sandbars and seasonally flooded overbank areas needed for reproduction. The small amount of water consumption associated with the Proposed Action would not cause discernible impacts to the Colorado River flow regime.

No Action Alternative

Under the No Action Alternative, any action requiring Federal approval would be denied and there would be no new surface disturbance. This would eliminate new impacts to BLM sensitive animal species.

Analysis on Public Land Health Standard 4 for Special Status Species

The conclusions of the *Land Health Assessment for the Battlement Mesa Area* (BLM 2000) as related to special status species are as follows. Suitable lynx habitats for Canada lynx in the assessment area were rated as achieving Standard 3 for healthy plant and animal communities; therefore, Standard 4 was also being met for this species. For bald eagles, other raptors, and big river fishes, while site specific locations were not achieving Standard 3, the overall habitat conditions indicate that the assessment area as a whole was achieving Standard 4 for these species. Riparian habitats in the assessment area were rated as properly functioning and water quality data related to Standard 5 showed parameters to be suitable to support and sustain fish species.

The fact that special status plant species were not found in the assessment area was probably a function of the lack of potential habitat rather than any management actions that may have created unsuitable habitat conditions; therefore, it was determined that Standard 4 was being achieved for special status plants in the assessment area. However, large portions of the landscape are being fragmented due to extensive oil and gas development. Continued habitat fragmentation is of concern, because large blocks of contiguous, intact habitat are required by many species. Sustained development and the proliferation of roads, well pads, pipelines, compressor stations, tank farms and other surface facilities will continue to reduce habitat patch size and affect both habitat quality and quantity. The potential to impact some species would increase as development continues. The Proposed Action, in conjunction with similar activities throughout this watershed, would increase fragmentation and could increase sediment loads. Although the contribution of the Proposed Action would be minimal, it may further trend the area away from meeting Standard 4 for special status wildlife.

Vegetation (includes an analysis on Public Land Health Standard 3)

Affected Environment

The proposed road and pipeline alignment would be constructed within a pinyon-juniper woodland community. Pinyon pines are fairly uncommon in the area but some older-aged pinyons do occur. The understory vegetation is predominantly cheatgrass with very little native grasses or forbs due to the dense overstory canopy. The pad would lie in a Wyoming big sagebrush community. Besides Wyoming big sagebrush, other frequent shrubs include greasewood (*Sarcobatus vermiculatus*), shadscale (*Atriplex confertifolia*), and snakeweed (*Gutierrezia sarothrae*). The dominant understory vegetation is primarily the annual non-natives cheatgrass and clasping pepperweed and a few native perennials including galleta grass (*Pleuraphis jamesii*), needle-and-thread grass (*Hesperostipa comata*), and the forb scarlet globemallow (*Sphaeralcea coccinea*).

Environmental Consequences

Proposed Action

The expected short-term disturbance of the proposed development would be approximately 7.9 acres. Following interim reclamation, the area of long-term disturbance would be 2.5 acres. With implementation of reclamation practices identified in Appendix A, establishment of desirable herbaceous vegetation on the unused portions of the pad, pipeline, and road could be restored within 2 to 3 years. The establishment of mature shrubs could take 5 to 25 years, and the establishment of trees would take even longer. Because of periodic workovers and the potential for additional well bores to be drilled from this pad, it is likely that vegetation would remain in an early seral stage for the life of the wells.

No Action Alternative

Under the No Action alternative, no construction or development activities would take place; therefore, vegetation would not be affected.

Analysis on Public Land Health Standard 4 for Plant and Animal Communities (partial, see also Wildlife, Aquatic and Wildlife, Terrestrial)

The poor condition of vegetation communities was the most widespread problem noted on this landscape. Sites not achieving the standard are in sagebrush and shadscale communities and pinyon-juniper woodlands. On the sagebrush sites, species, lifeform, and age class diversity is lacking. Few perennial

grasses or forbs are found. Cheatgrass is frequently dominant on the sites. Several sagebrush stands have healthy vigorous sagebrush with good recruitment of sage seedlings, but sagebrush on most sites is moderately to heavily hedged and lacking in vigor and reproduction. A number of the sagebrush sites are being invaded by young juniper and pinyon trees. These sites varied in terms of the degree of encroachment, but eventually these sites will become dominated by pinyon-juniper unless something is done to set back succession and regenerate the sagebrush.

Most of the pinyon-juniper woodlands consist of mature Utah juniper with lesser amounts of pinyon pine. Most of these woodland sites have very few understory species present. Perennial grasses and forbs are generally minimal or absent, and where shrubs are present, often they are decadent or in poor vigor. Age class diversity is poor with most plants in the mature to overmature stage with little recruitment and establishment of younger age classes. Cheatgrass is abundant and occasionally dominant under the tree canopy (BLM 2000).

The Proposed Action would likely contribute, albeit in a minor way, to the further deterioration of vegetation communities and would move the area further from achieving conformance with the standard. The No Action alternative would have no bearing on the ability of the area to meet the public land health standard for plant and animal communities because no development activities would take place.

Visual Resources

Affected Environment

The proposed pad, access road, and surface pipeline are located on public lands administered by the BLM southwest of Parachute, Colorado and south of I-70. These lands are classified as Visual Resource Management (VRM) Class II, III, and IV as identified by the 1984 Glenwood Springs Resource Management Plan. The objectives for VRM Classes II, III, and IV, as defined in the BLM Manual H-8410-1, Visual Resource Inventory (BLM 1986), are described below.

- The objective of VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- The objective of VRM Class IV is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The project area consists of rolling hills rising out the Colorado River valley leading up to mountains in the background. The area is characteristic of rural agricultural/ranching land, scattered rural residences, oil and gas development, and sporadic industrial development paralleling I-70. The Proposed Action would occur at the base of the west-facing slope of High Mesa, which sits between a series of smaller

mesas to the west; the flanks of Battlement Mesa to the south; Morrisania Mesa and Doghead Mountain to the East; and the Colorado River valley floor to the north. Dominant vegetation within the project area is dense, dark-green pinyon-juniper woodland with an understory of forbs and grasses.

The proposed PE25 pad would occur entirely on VRM Class III land. Whereas, the proposed access road and surface pipeline would occur on a combination of VRM Class II, III, and IV lands (Figure 4 and Table 11).

Table 11. Summary of VRM Class Designations Applicable to the Proposed Access Road

Project Component	***CRVFO VRM Class Designation***		***Total on BLM Land***
	Class II	***Class III***	
Proposed Access Road	1,002 feet (0.2 mile)	1,017 feet (0.2 mile)	2,019 feet (0.4 mile)

Calculations are derived using GIS data provided by the operator. Each project component was clipped to its associated VRM Class Designation and the length in feet was calculated for each segment.

The visual resource analysis area includes I-70, the I-70 frontage road (State Highway 6/24), and County Road 300 (Stone Quarry Road). This viewshed is considered to be important, as it is viewed by a large number of people who live, work, recreate, and travel through the area via I-70. The Proposed Action would occur in the viewer's foreground, less than 5 miles from each of these travel corridors. BLM guidance states that lands with high visual sensitivity are those within five miles of a primary travel corridor and of moderate to very high visual exposure, where details of vegetation and landform are readily discernible and changes in visual contrast can be easily noticed by the casual observer.

The visual impact analysis for this project is based on the views from 3 Key Observation Points (KOPs) representing 2 linear viewer locations representing the viewing angle and direction with the highest frequency of viewers: the I-70 frontage road (State Highway 6/24), and County Road 300 (Stone Quarry Road). All 3 KOPs represent typical views that a viewer would see while traveling west and east along I-70, as evident by the nearby Williams SG41-26 pad, the project area is readily visible from Interstate 70, the Colorado River valley floor, and County Road 300 (See Figures 5, 6, and 7).

KOP 1 (Figure 5) is located on the I-70 frontage road (State Highway 6/24) where it crosses over I-70. This location represents the typical view a viewer would have traveling west along I-70. From this particular location, the viewer would be at an elevation similar to the project, whereas viewers traveling along I-70 would be slightly below the project. The foreground consists of the flat river valley with mixed riparian and agricultural vegetation and associated development.

KOP 2 (Figure 6) is located on the I-70 frontage Road (State Highway 6/24) where it runs parallel to I-70. This location represents the view from both eastbound and westbound traffic on I-70. The viewer would be located at an equal or lower elevations to the project and at a 90-degree angle from the project. The foreground is similar to KOP 1.

KOP 3 (Figure 7) is located on County Road 300 (Stone Quarry Road) and runs directly adjacent to the Proposed Action. This location represents the typical view a viewer would have traveling east along I-70. The viewer would be located at an equal or lower position to the Proposed Action with a direct to a 90-degree view. The foreground is similar to KOP 1 and KOP 2.

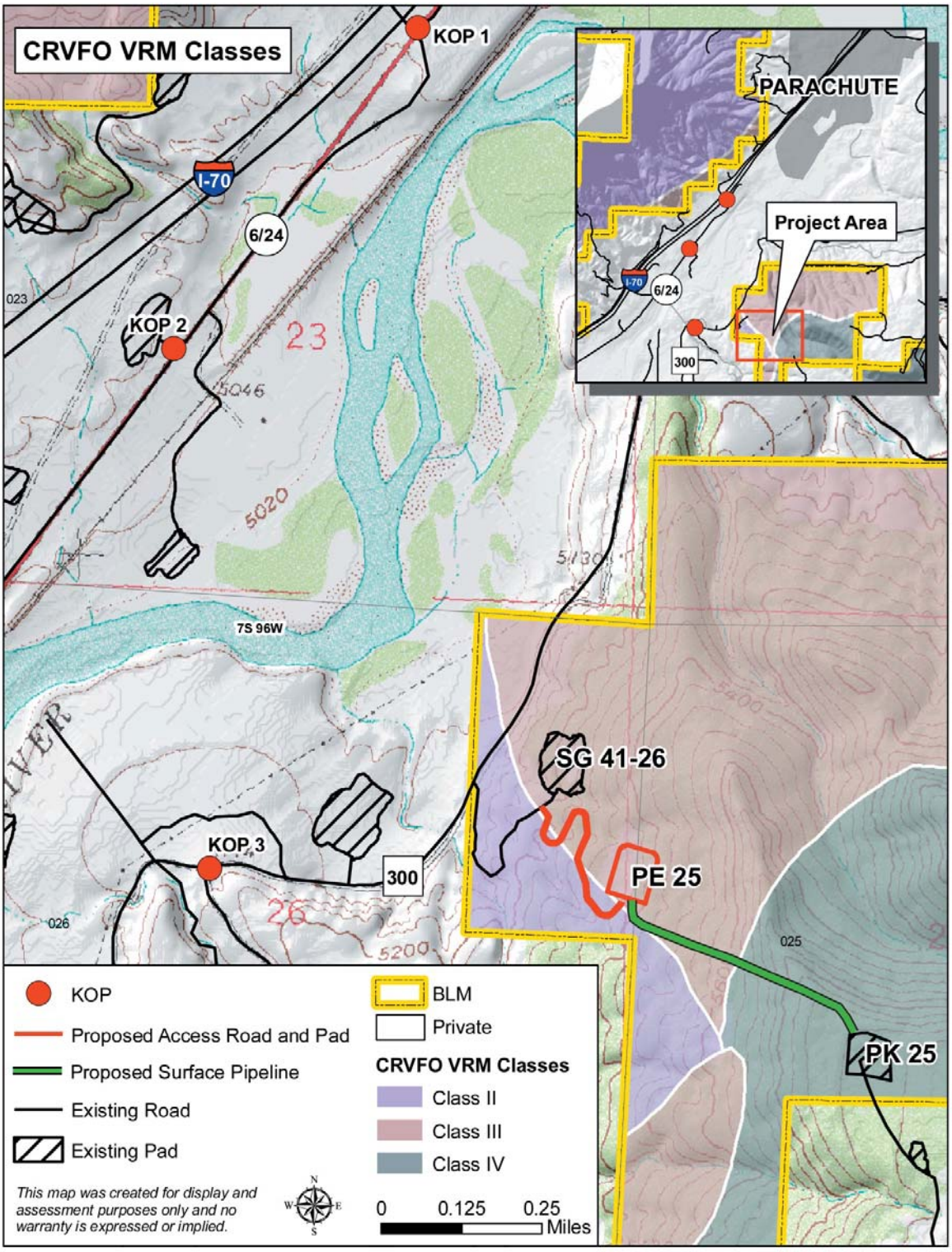

Figure 4. Proposed Action Relationship to VRM Class Designations.

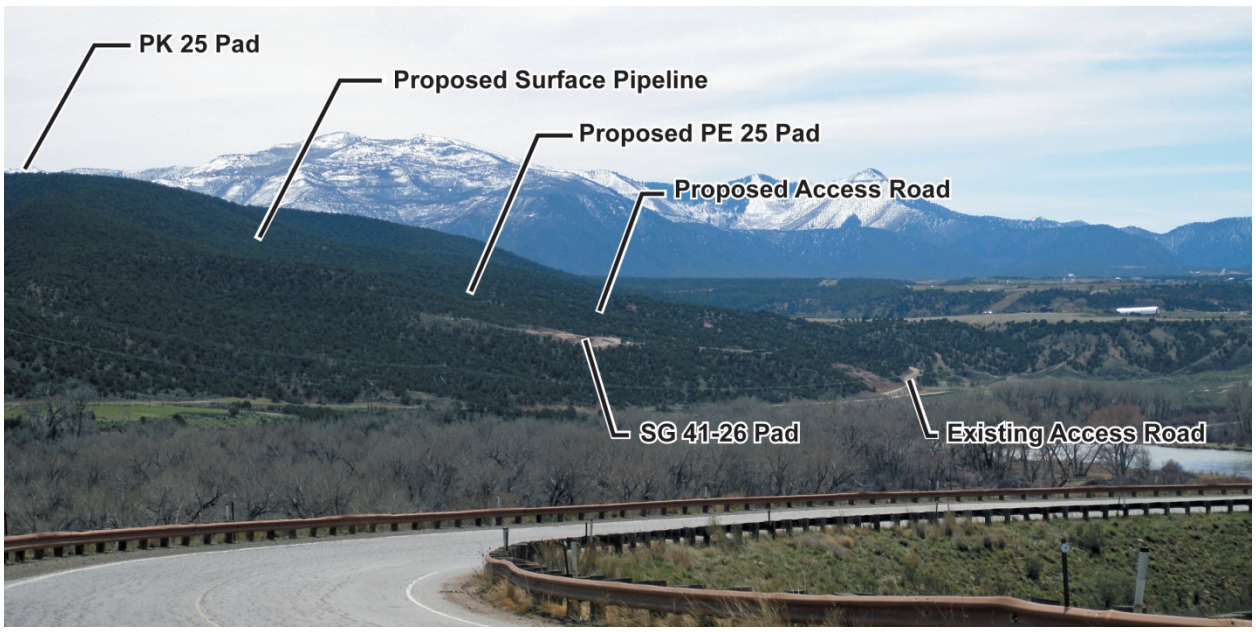

Figure 5. KOP 1

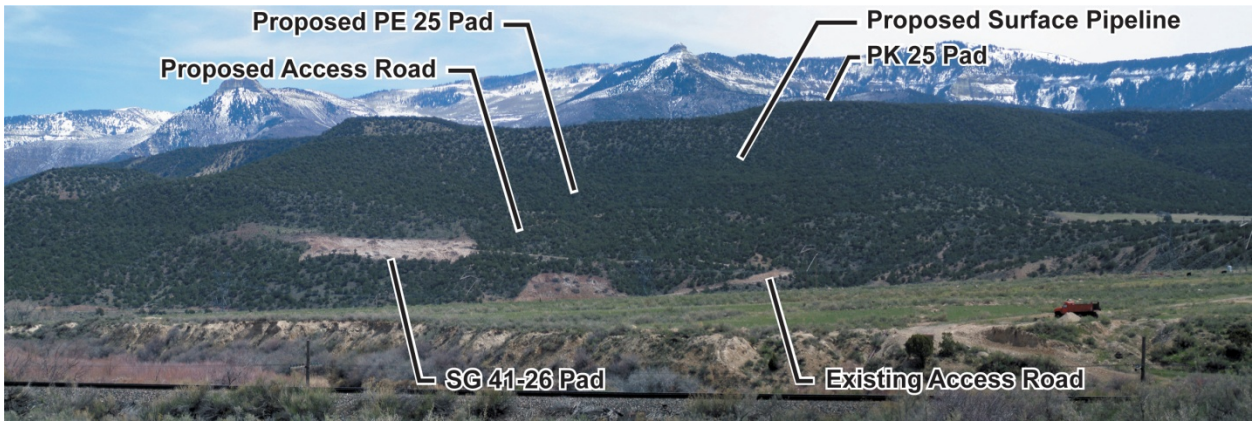

Figure 6. KOP 2

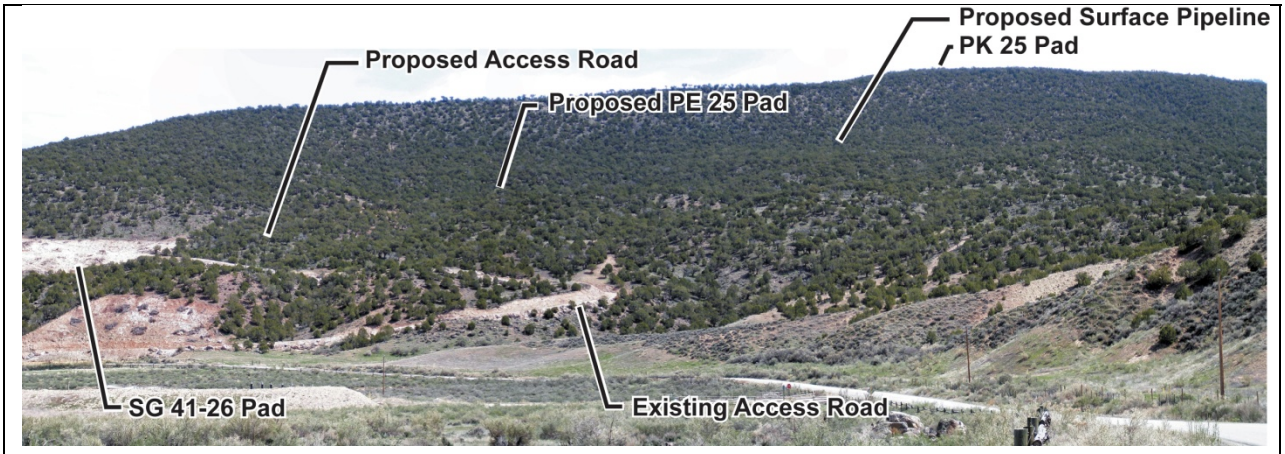

Figure 7. KOP 3

Environmental Consequences

Proposed Action

Short-term visual impacts due to pad and access road construction, surface pipeline installation, and drilling and completion activities would occur within the project area. Construction of the proposed project would create contrast within the landscape by removing the existing vegetation, exposing bare ground, and creating distinct lines and forms within the landscape. The new pad, surface facilities, access road, and surface pipeline would increase the presence of drilling rigs, heavy equipment (e.g., dozers, graders, etc.), and vehicular traffic with an associated increase in dust, light pollution, and well flaring. All of the project components would be constructed on public land and would be subject to the BLM VRM management objectives.

Proposed Access Road

The entire 0.4 mile of new access road would be constructed on BLM land creating 1.9 acres of new surface disturbance. The access road is located in VRM Class II and Class III, 0.2 mile of the new access road would be constructed within VRM Class II, and 0.2 mile would be within VRM Class III (Table 11). However, after road alignment changes were made during the field onsites, most of the road would not be directly visible from I-70, the Colorado River valley floor, or County Road 300. The planned alignment would take advantage of the existing juniper tree cover and topography to avoid contrasts in the landscape. Prompt reclamation of the road cuts and fills would help mitigate or soften the typical contrasts common with road construction footprints. The proposed access road would satisfy the VRM Class II and III objectives by not being readily evident or dominate in the landscape.

Average disturbance width for the proposed road would be 40 feet. Total short-term disturbance associated with road construction would amount to 1.9 acres. The long-term disturbance (essentially the 20-foot road travel way including the road ditches) would be 1.0 acre.

Proposed PE25 Pad

The entire PE25 well pad (5.5 acres) would be constructed within a VRM Class III area. The well pad, located on a flat sagebrush bench, would not be readily visible from County Road 300 or the I-70 corridor except during the drilling and completion phase of the project when the 33-foot pad cut slope in the southeast corner would likely be evident. The scale of the 25-foot fill slope in the northwest corner of the pad would be masked by the existing juniper tree cover, topography, and the angle of view the casual observer would have while traveling along I-70. The pad would benefit from prompt reclamation to help mitigate or soften the contrasts created by the cut and fill slopes.

Construction of the well pad would result in approximately 5.5 acres of new surface disturbance, which would be reduced to approximately 1.5 acres after interim reclamation.

Proposed Surface Pipeline

The surface pipeline would be located within VRM Class II and IV areas. The pipeline would be fed downhill and cross-country through the juniper woodland forest from the existing PK25 pad to the PE25 pad. The disturbance would be short-term, amounting to 0.5 acres of surface disturbance. The extent of the damage from the surface line installation would be limited to individual trees and not result in any long-term disturbance acreage.

No Action Alternative

Under the No Action alternative, none of the components of the Proposed Action would be approved, and no new surface disturbance would occur. This would avoid new impacts to the existing visual environment. However, the visual impacts associated with production activities and traffic related to the existing eight SG41-26 wells would continue for the producing life of the wells.

Wastes, Hazardous or Solid

Affected Environment

The affected environment for hazardous materials includes air, water, soil, and biological resources that may potentially be affected by an accidental release of hazardous materials during transportation to and from the project area, storage, and use in construction and operations. Sensitive areas for hazardous materials releases include areas adjacent to water bodies, above aquifers, and areas where humans or wildlife would be directly impacted.

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The Glenwood Springs Resource Area, Oil & Gas Leasing & Development, Draft Supplemental Environmental Impact Statement (June 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for oil and gas projects. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. These practices are dictated by various Federal and State laws and regulations, and the BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the U.S., which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.

- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCA) (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency produced plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.

- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. BLM would have access to regional resources if justified by the nature of an incident.

Environmental Consequences

Proposed Action

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the pads, roads, and pipelines, and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation phases would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities.

Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with production and transmission of natural gas.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed of during construction or operation of the facilities. None of the chemicals that would be used in construction meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above threshold planning quantities would be produced, used, stored, transported, or disposed of during construction or operation of the facilities.

Solid waste (human waste, garbage, etc.) would be generated during construction activities and, to a limited extent, during project operations. These would be removed to a landfill or water treatment facility as needed, and all would be removed prior to interim reclamation.

Surface water or groundwater could be impacted under the Proposed Action. Pollutants that might be released during the operational phase of the project could include condensate, produced water (if the wells in the area produce water) and glycol (carried to the site and used as antifreeze). While uncommon, an accident could occur that could result in a release of any of these materials. A release could result in contamination of surface water or soil. Improper casing and cementing procedures could result in the contamination of groundwater resources. In the case of any release, emergency or otherwise, the responsible party would be liable for cleanup and any damages. Depending on the scope of the accident, any of the above referenced contingency plans would be activated to provide emergency response. At a minimum, the BLM Grand Junction Field Office contingency plan would apply.

These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to adequately mitigate any potential hazardous or solid waste issues associated with the Proposed Action.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts associated with hazardous or solid wastes would occur.

Water Quality, Surface and Ground (includes an analysis on Public Land Health Standard 5)

Surface Water

Affected Environment

The Proposed Action of the project area is within the Colorado River around Wallace Creek 6th-code watershed unit. The area drains directly toward the Colorado River, approximately 0.5 mile northwest of the PE25 pad site.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), the surrounding drainages are within segment 13a, which includes most tributaries to the Colorado River a point immediately below from its confluence with Parachute Creek to the Colorado/Utah border. Following is a brief description of segment 13a.

- Segment 13a – This segment has been classified aquatic life warm 2, recreation 1b, and agriculture. Aquatic life warm 2 indicates that this watercourse is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class 1b waters are designated "potential primary contact," where a reasonable level of inquiry has failed to identify any existing primary contact uses, but no use attainability analysis has been completed demonstrating that a class 2 ("secondary contact") designation is appropriate. This segment is suitable or intended to become suitable for agricultural purposes that include irrigation and livestock use.

At this time, no water quality data exist for the ephemeral drainages near the PE25 pad site. These drainages are not on the State of Colorado *Stream Classifications and Water Quality Standards* List (CDPHE, WQCC Regulation No. 37) (CDPHE 2007) or the State's *303(d) List of Water Quality Limited Segments Requiring TMDLS* (CDPHE, WQCC Regulation No. 93) (CDPHE 2006). Data were also collected from the Colorado River below the project area near Rulison in 1977 and 1978 (Table 12).

Table 12. Selected Water Quality Data for Two Sampling Locations near the Project Area

Parameter	***Colorado River below Rulison CO, USGS Site #09092570 01/18/1978***	***Colorado River below Rulison CO, USGS Site #09092570 4/8/1977***
Instantaneous discharge (cfs)	1,500	1,560
Temperature, water (°C)	2.5	11
Field pH (standard units)	7.9	8.1
Specific conductance (µS/cm/cm at 25°C)	1,320	1,200
Total Dissolved Solids (mg/L)	756	733
Hardness as CaCO3 (mg/L)	280	250
Chloride (mg/L)	230	230
Selenium (µg/L)	2	1
Dissolved oxygen (mg/L)	11.2	10
Source: USGS 2007a, b		

No sediment measuring stations are present on the Colorado River or its tributaries near the pad location. The closest downstream station on the Colorado River is near DeBeque, Colorado. A summary of USGS data collected at this station indicates that the mean sediment load was 1,817 tons per day during the period of 1974 to 1976. The maximum and minimum for this location during the same period was 41,300 and 8 tons/day, respectively (USGS 2007b).

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams due to changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would collectively last approximately 30 to 45 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short-term, access roads would remain in place over the life of the well (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with roads would be reduced through the implementation of Best Management Practices (BMPs) and other preventative measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, limiting road grade to 10%, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all new or upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. Once completion operations are complete, excess liquids would be allowed to evaporate and backfilling of the pit would be performed in a manner that would avoid incorporating the mud into surface soils. Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in a containment area to prevent migration to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use. Cuttings pits must be decontaminated to COGCC standards prior to pit closure; the table of applicable standards can be found at http://cogcc.state.co.us/RR_docs_new/rules/900Series.pdf

Part of the Proposed Action would fall within the Major River Corridor buffer zone (½ mile from river's edge). There is an exception criterion for the Major River Corridor No Surface Occupancy stipulation that states, "The distance from the river may be reduced after the Authorized Officer has considered the habitat values and the species present, the topographical and vegetation characteristics of the area, and the type and amount of surface disturbance proposed." The project site does not possess important riverine characteristics, as the site is vegetated with greasewood, juniper, sagebrush, and a primary understory of cheatgrass. As such, the proposed project at its existing location would satisfy the exception criteria for this stipulation.

Refer to Appendix A for standard Conditions of Approval that would mitigate impacts to surface water. Through the use of COAs and BMPs associated with construction activities, prompt interim reclamation, and the implementation of the preventative measures associated with the treatment of fluids, impacts to surface waters would be minimized and should be minor.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to surface water would accompany the Proposed Action.

Waters of the U.S.

Affected Environment

Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. Army Corps of Engineers prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. A Department of the Army permit is required for both permanent and temporary discharges into waters of the United States.

Environmental Consequences

Proposed Action

No new crossings of waters of the U.S. or streams that are potentially waters of the U.S. are included in the Proposed Action, nor would pad construction be expected to result in discharges of fill into waters of the U.S.

Improperly designed crossings of small ephemeral drainages, in particular undersized or poorly aligned culverts, could result in soil degradation that could include excessive erosion at culvert outlets, potentially supplying sediment to the Colorado River approximately 0.5 mile to the northwest. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect the Colorado River and any other waters of the U.S. that could be impacted by such long-distance stormflow transport.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to waters of the U.S. would accompany the Proposed Action.

Groundwater

Affected Environment

The proposed activities are located within the Division of Water Resources (DWR) Water Division 5, the Colorado River Basin Main Stem. The groundwater in this division is generally found in both alluvial and sedimentary aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the region and consist of boulders, cobbles, gravel, sand, silt, and clay. Alluvial well depths are generally less than 200 feet and water levels typically range between 100 to 150 feet. The thickness of the alluvium tends to be thicker in the lower reaches and basin center where it can accumulate easier but thinner at the basin margins due to increased slopes and higher flow velocities. Well yield is dependent upon the intended use of the well, well construction design, sediment type and saturated thickness. Domestic use wells are limited to 15 gallons per minute (gpm) administratively, while municipal wells are designed and constructed for maximum potential yield.

The project area is in the lower Piceance Basin aquifer system. The Piceance Basin contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the Piceance Basin. The groundwater exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and consists of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but tends to be thinner in the upper reaches and thicker in the lower reaches. Generally, alluvial well depths are less than 200 feet, and typical water levels range from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin can vary widely, and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from fertilizer and pesticide leaching.

The most important bedrock aquifers are known as the upper and lower Piceance Basin aquifer systems. These consolidated bedrock aquifers occur within and above the large oil shale reserves. The upper and lower aquifers are separated by the Mahogany Zone of the Parachute Creek Member of the Tertiary Green River Formation. The Mahogany Zone is a poorly permeable oil shale, which effectively serves as an aquitard. Both bedrock aquifers overlie the older Cretaceous Mesaverde Group, the target zone of the subject wells. South of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The surface formation of the proposed pad is the Shire Member of the Wasatch Formation.

Groundwater is recharged from snowmelt in upland areas that receive more precipitation than lower altitude areas. In the Piceance Basin, recharge flows from areas near the margins of the basin to discharge areas near principal stream valleys. The groundwater moves laterally and/or upward discharging directly into streams, springs, and seeps by upward movement through confining layers and into overlying aquifers or by withdrawal from wells (USGS 2007a). The natural discharge areas generally are found along the Colorado River and its tributaries (USGS 2007b).

According to the Colorado Division of Water Resources (DWR), no fresh-water wells are located within a 0.5-mile radius of the proposed activities, though there are three fresh-water wells located within a 1-mile radius. All three wells are located northwest of the PE25 pad, range in depth from 50 to 100 feet, have a static water level between 15 and 40 feet, and have discharge rates ranging between 4 and 15 gallons per minute.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the Proposed Action would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing (fracing) would be incorporated to complete the wells, which would include produced and freshwater mixed with proppants, or propping agents, to stimulate the formation to create fractures that would allow gas to travel more freely from the rock pores where the gas is trapped. Hydrofracturing would be conducted at 5,000 feet or more below ground surface, and would be unlikely to cause impacts to groundwater resources near the surface, such as springs or shallow alluvium. However, isolation of any water bearing zones during installation of the production casing would minimize the effects, as well as cementing the production casing to 200 feet above the top of the Mesaverde Group. It is highly unlikely that any deep groundwater resources would be affected, as the thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to potable water zones.

No Action Alternative

Under the No Action alternative, the development of the Federal wells proposed for the PE25 pad would not be approved.

Analysis on Public Land Health Standard 5 for Water Quality

The Proposed Action and the No Action alternative would be unlikely to prevent Standard 5 from being achieved. This is due to the lack of water bodies and riparian areas that would be affected by the project and by the lease stipulations, COAs, and requirements set for permitting by the COGCC and USACE.

Wildlife, Aquatic (includes an analysis on Public Land Health Standard 3)

Affected Environment

Aquatic habitat is severely limited given the intermittent nature of project area drainages.

Environmental Consequences

Proposed Action

Because no aquatic habitats occur within the project area, the Proposed Action would not have direct impacts on aquatic wildlife. Potential indirect effects to special status fishes in the Colorado River are discussed in the section on Special Status Species..

No Action Alternative

Under the No Action Alternative, any action requiring Federal approval would be denied and there would be no new surface disturbance. This would avoid new impacts to aquatic wildlife.

Wildlife, Terrestrial (includes an analysis on Public Land Health Standard 3)

Affected Environment

Mammals

The site is located within winter range and severe winter range for both mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*) as mapped by CDOW (2008). Winter range is that part of the overall range of a species where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site-specific period of winter as defined for each data analysis unit (DAU) (CDOW 2008). Severe winter range is that part of the range of a species where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten (CDOW 2006). Field surveys indicate that the project area is occupied winter range for elk and that mule deer occupy on a year-round basis.

Large carnivores present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). CDOW (2008) has mapped all of the analysis area as black bear (*Ursus americanus*) overall range. Mountain lions move seasonally to generally follow migrations of their preferred prey, mule deer. Two medium-sized carnivores, the coyote (*Canis latrans*) and bobcat (*Lynx*

rufus), are also present throughout the region in open habitats and broken or wooded terrain, respectively, where they hunt for small mammals, reptiles, and ground-dwelling birds. Smaller carnivores in habitats similar to those near the project site include the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*).

Small mammals present within the planning area include rodents such as the rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrels *(Spermophilus lateralis)*, least chipmunk (*Tamias minimus*), and packrat (bushy-tailed woodrat)(*Neotoma cinerea*), as well as the mountain cottontail (*Sylvilagus nuttallii*). Rodents and, to a lesser extent rabbits, are the primary prey base for a variety of avian and mammalian predators.

Birds

Raptors potentially nesting in the juniper woodlands throughout the project vicinity include small hawks (Cooper's hawk, sharp-shinned hawk) and, where taller conifers are present for nesting or perching, larger resident raptors (red-tailed hawk, Northern goshawks and great horned owl). Other birds of prey potentially present include three small owls: the migratory flammulated owl and the resident northern pygmy owl and northern saw-whet owl, the latter two primarily where tall conifers or tall deciduous trees are present among the shrubs.

Other residents or short-distance migrants species in the project vicinity include the northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), black-billed magpie (*Pica hudsonia*), western scrub-jay (*Aphelocoma californica*), mountain and black-capped chickadees (*Poecile gambeli, P. atricapillus*), American robin, Townsend's solitaire, blue-gray gnatcatcher (*Polioptila caerulea*), and house finch (*Carpodacus mexicanus*). See the sections on Migratory Birds and Special Status Species for discussions of other birds in the area.

One upland gamebird species occurs in the project vicinity, the wild turkey (*Meleagris gallopavo*). Although the area is not mapped by CDOW as a turkey concentration area, the abundant acorns and berries that attract black bears are likely to also attract turkeys, particularly in fall, but also in other seasons when they can forage for other plant and invertebrate food items in the dense leaf litter.

Reptiles and Amphibians

Species most likely to occur include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in xeric shrublands or grassy clearings and the western terrestrial garter snake (*Thamnophis elegans*) along creeks. Other reptiles potentially present along creeks, although more commonly found at lower elevations than the site, are the milk snake (*Lampropeltis triangulum*), and smooth green snake (*Opheodrys vernalis*).

The surrounding area is also possible habitat for the northern leopard frog (see the section on Special Status Species) and two additional amphibians, the Woodhouse's toad (*Bufo woodhousii*) and western chorus frog (*Pseudacris triseriata*). Within the CRVFO and vicinity, the Woodhouse's toad occur primarily along ephemeral washes that do not support fish and contain pools of water for a period of at least a few weeks every spring. The chorus frog occurs primarily in cattail and bulrush wetlands and along the vegetated margins of seasonal or perennial ponds and slow-flowing streams. Habitat for both of these species is limited and marginal in the project vicinity.

Environmental Consequences

Proposed Action

The Proposed Action would result in the initial loss and fragmentation of 7.9 acres of wildlife habitat. Following partial reclamation of new well pads and roads, long-term forage disturbance would be reduced to approximately 2.5 acres for the Proposed Action. Reclamation activities would benefit some wildlife species by increasing herbaceous forage. In areas where shrubs and trees would be disturbed, impacts to wildlife from loss of thermal and/or hiding cover would be long-term, lasting the 20 to 30+ years following reclamation that it would take for these woody species to re-establish. Surface disturbing activities within these habitats during the winter and during migratory seasons have the potential to displace mule deer and elk from these important habitats.

Construction activities, soil disturbance, and traffic could potentially spur the introduction and spread of weed species within the project area. Weed invasion and establishment has become an increasingly important concern associated with surface disturbing activities in the West. Weeds often out-compete native plant species, rendering an area less productive as a source of forage for wildlife. However, implementation of the suggested mitigation measures in the Invasive, Non-Native Weeds section of this EA would minimize the potential for invasion and establishment of undesirable plants.

Indirect impacts on wildlife, especially big game and raptors, would be the disturbance caused by increased human activity, equipment operation, vehicle traffic, harassment by any dogs brought to the site by contractors, and noise related to drilling and completion activities. Most species are relatively secretive and distance themselves from these types of disturbance or move to different areas screened by vegetation or topographic features. This avoidance, referred to as displacement, results in underuse of habitat near the disturbance. Avoidance of forage and cover resources adjacent to disturbance reduces habitat utility and the capacity of the affected acreage to support wildlife (BLM 1999a).

The new access road and the western half of the PE25 pad would occur on Federal lease COC59137, which has a timing limitation prohibiting construction, drilling, or completion activities from December 1 through April 30 to protect use by big game of winter habitats. The surface holes, eastern portion of the pad, and surface pipelines would occur on Federal lease COC27825, which has a big game winter timing limitation from January 1 through May 31. For the purposes of this project and to maintain consistency with the timing limitation placed on the nearby SG41-26 pad, the standard 5-month winter timing limitation identified in the existing land use plan (December 1 – April 30) would be attached to approved APDs and BLM right-of-way grants.

No Action Alternative

Under the No Action Alternative, any action requiring Federal approval would be denied and there would be no new surface disturbance. This would eliminate new impacts to terrestrial wildlife .

SUMMARY OF CUMULATIVE IMPACTS

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. Cumulative impacts have included (1) direct habitat loss; (2) habitat fragmentation and decreases in habitat effectiveness; (3) elevated potential for runoff, erosion, and

sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999: 4-1 to 4-68).

Although none of the cumulative impacts described in the 1999 FSEIS was characterized as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is nonetheless clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, has until recently been increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) residential and commercial expansion, as well as most of the oil and gas development, has occurred private holdings lands where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the Proposed Action would contribute to the collective adverse impact for some resources. Although the contribution would be minor, the Proposed Action would contribute incrementally to the collective impact to air quality, vegetation, migratory birds, terrestrial wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

Colorado Oil and Gas Conservation Commission: Dave Kubeczko
Encana Oil & Gas (USA) Inc.: Miracle Pfister, Scott Parker, Bob Anderson, Renata Busch, Bryan Whiteley, Jevin Croteau
Wasatch Surveying: Ted Taggart, Buck Hinkson
Williams Production: Dan Collette, Bryan Hotard

INTERDISCIPLINARY REVIEW

BLM staff from the CRVFO who participated in the preparation of this EA are listed in Table 13. This participation included review of survey results submitted by Encana's consultants, evaluation of anticipated impacts, and identification of appropriate COAs to be attached and enforced by BLM.

Table 13. BLM Interdisciplinary Team Authors and Reviewers

Name	***Title***	***Areas of Participation***
Beth Brenneman	Ecologist	Invasive Non-native Species, Special Status Species Vegetation
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Jim Byers	Natural Resource Specialist	EA Project Lead, Access & Transportation, Range Management, Socio-Economics
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	NEPA Review
William Howell	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D.	Hydrologist	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.
Julie McGrew	Natural Resource Specialist	Visual Resources
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status Species, Aquatic and Terrestrial Wildlife
Todd Sieber	Geologist	Fossil Resources, Geology and Minerals, Groundwater

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FONSI
DOI-BLM-CO-040-2010-0042 EA

The environmental assessment (EA) analyzing the environmental effects of the Proposed Action (construction of the proposed Encana's PE25 well pad and associated access road and pipelines for the purpose of drilling and completing eight oil and gas wells in Federal lease COC27825) has been reviewed. Project design and mitigation measures result in a Finding of No Significant Impact on the human environment. Therefore, an environmental impact statement (EIS) is not necessary to further analyze the environmental effects of the Proposed Action.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action and mitigation measures described in this EA and appendices. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.

2. The environmental impacts have been mitigated with measures included in the attached Conditions of Approval (COAs).

3. This Decision does not authorize the drilling of any Federal oil and gas wells or the initiation of surface-disturbing activities on Federal surface lands for the PE25 well pad, access road, or pipeline. Those authorizations are limited to approval by the BLM of Applications for Permits (APDs) for the individual Federal wells and of issuance by the BLM of right-of-way grants for off-lease portions of the pad, access road, and surface natural gas and water pipelines.

MITIGATION MEASURES: Mitigation measures presented in Appendices A and B will be incorporated as COAs.

NAME OF PREPARER: Jim Byers, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:

Allen B Crockett

Supervisory Natural Resource Specialist

DATE SIGNED: May 27, 2011

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APPENDIX A

Surface-Use and Downhole Conditions of Approval

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SITE-SPECIFIC SURFACE USE CONDITIONS OF APPROVAL
DOI-BLM-CO-N040-2010-0042-EA

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction.

2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards *(Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition—Revised 2007, BLM/WO/ST-06/021+3071/REV 07.)*. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.

3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.

4. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

   Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado/Gunnison Basin Regulatory Office at 970-243-1199.

   Pipelines installed beneath stream crossings shall be buried at a minimum depth of 4 feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, the channel grade and substrate composition shall be returned to pre-construction conditions.

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado/Gunnison Basin Regulatory Office at 970-243-1199.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Glenwood Springs Field Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.

7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.

   a. Deadline for Temporary Seeding and Interim Reclamation. Interim reclamation to reduce a well pad to the maximum size needed for production, including seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned for the pad. Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines shall be completed within 30 days following completion of construction. The deadlines for seeding described are subject to extension upon approval of the BLM based on season, timing limitations, or other constraints on a case-by-case basis. If the BLM approves an extension for seeding, the operator may be required to stabilize the reclaimed surfaces using hydromulch, erosion matting, or other method until seeding is implemented.

   b. Topsoil Stripping, Storage, and Replacement. Topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. This shall include, at a minimum, the upper 6 inches of soil. Any additional topsoil present at a site, such as indicated by color or texture, shall also be stripped. The BLM may specify a stripping depth during the onsite visit. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation.

   c. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

      Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding, and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.

      Seedbed preparation is not required for topsoil storage piles or other areas of temporary seeding.

      Requests for use of soil amendments, including basic product information, shall be submitted to BLM for approval.

   d. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (see Attachments 1 and 2 of the letter provided to operators dated May 1, 2008). Note that temporary seeding allows use of a seed mix containing sterile hybrid non-native species in addition to native perennial species.

For private surfaces, the menu-based seed mixes are recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5% by weight of other weed seeds. Seed may contain up to 2.0% of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower% age of other crop seed is recommended. Seed tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

e. Seeding Procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation.

Where practicable, seed shall be installed by drill seeding to a depth of 0.25 to 0.5 inch. Where drill seeding is impracticable, seed may be installed by broadcast seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover. Hydroseeding and hydromulching may be used in temporary seeding or in areas where drill seeding or broadcast-seeding/raking are impracticable. Hydroseeding and hydromulching must be conducted in two separate applications to ensure adequate contact of seeds with the soil. If interim revegetation is unsuccessful, the operator shall implement subsequent reseedings until interim reclamation standards are met. Requirements for reseeding of unsuccessful temporary seeding will be considered on a case-by-case basis.

f. Mulch. Mulch shall be applied within 24 hours following completion of seeding. In areas of interim reclamation that used drill-seeding or broadcast-seeding/raking, mulch shall consist of crimping certified weed-free straw or certified weed-free native grass hay into the soil. Hydromulching shall be used in areas of interim reclamation where crimping is impracticable, in areas of interim reclamation that were hydroseeded, and in areas of temporary seeding regardless of seeding method.

NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

g. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Biodegradable matting, bales, or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.

h. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50% of the new plants are producing seed. The BLM will approve the type of fencing.

i. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as "operator reclamation in progress" and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator

shall be responsible for implementing the corrective actions or other measures specified by the BLM.

8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators,* dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.

9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **December 1 through April 30** annually.

10. Raptor Nesting. Raptor nest surveys for the PE25 project conducted on April 7, 2010, resulted in no observations of raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility associated with this project. Therefore, a raptor nesting TL is not attached to this EA. However, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act (MBTA), the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity. Initiation of construction, drilling, or completion activities during the period February 1 to August 15 shall result in application and enforcement by the BLM of a 60-day TL for the period **May 1 to June 30**.

11. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to "take" of migratory bird species. Under the MBTA, "take" means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations—including but not limited to reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it should be employed as soon as practicable after the pit has begun receiving liquids. At a minimum, the method shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative to the CRVFO at 970-876-9051 and visit http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm.

12. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 1 to June 30** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA may be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting or otherwise present within 10 meters of the area to be disturbed. Nesting surveys shall include an audial survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and

10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period at the same location.

13. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.

14. *Ips* Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site. Removal, if selected, shall occur within 24 hours and shall be to a location approved by the Colorado State Forest Service.

15. Fossil Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

    Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM of any finds. The BLM will, as soon as feasible, have a BLM-permitted paleontologist check out the find and record and collect it if warranted. If ground-disturbing activities cannot be immediately suspended, the operator shall work around or set the discovery aside in a safe place to be accessed by the BLM-permitted paleontologist.

16. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution.

    Pursuant to 43 CFR 10.4(g), the BLM shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

    If in connection with operations under this contract, the operator, its contractors, their subcontractors, or the employees of any of them discovers, encounters, or becomes aware of any objects or sites of cultural value or scientific interest such as historic ruins or prehistoric ruins, graves or grave markers, fossils, or artifacts, the operator shall immediately suspend all operations in the vicinity of the cultural resource and shall notify the BLM of the findings (16 USC 470h-3, 36 CFR 800.112). Operations may resume at the discovery site upon receipt of written instructions and authorization by the BLM. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM from a Federal agency insofar as practicable. When not practicable, the operator shall bear the cost of the services of a non-Federal professional.

Within five working days, the BLM will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places
- what mitigation measures the holder will likely have to undertake before the site can be used (assuming that *in-situ* preservation is not necessary)
- the timeframe for the BLM to complete an expedited review under 36 CFR 800.11, or any agreements in lieu thereof, to confirm through the SHPO State Historic Preservation Officer that the findings of the BLM are correct and that mitigation is appropriate

The operator may relocate activities to avoid the expense of mitigation and delays associated with this process, as long as the new area has been appropriately cleared of resources and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM that the required mitigation has been completed, the operator will be allowed to resume construction.

Antiquities, historic ruins, prehistoric ruins, and other cultural or paleontological objects of scientific interest that are outside the authorization boundaries but potentially affected, either directly or indirectly, by the Proposed Action shall also be included in this evaluation or mitigation. Impacts that occur to such resources as a result of the authorized activities shall be mitigated at the operator's cost, including the cost of consultation with Native American groups.

Any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361).

17. Visual Resources. Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

    To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The BLM may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.

    Above-ground facilities shall be painted **Shadow Gray** to minimize contrast with adjacent vegetation or rock outcrops. The color shall be specified by the BLM and attached as a COA to individual APDs.

    During construction, BLM and Encana representatives shall jointly review construction measures to determine effectiveness in meeting visual resource mitigation measures, and if subtle changes in construction techniques are warranted.

    After construction, the road alignment and pad shall be reviewed to determine if the surface color detracts from the viewshed (as viewed from the KOPs). If it is determined that the road and/or pad surface color contrasts with the surrounding landscape, dust abatement measures with Magnesium Chloride or other dust abatement measure, as approved by the BLM authorized officer, shall be

required. The operator shall implement a regularly scheduled dust abatement application so that the road and pad surface takes on and maintains a dark appearance when the road is viewed from the KOPs. The level and type of treatment may be changed in intensity and must be approved by the BLM authorized officer. Magnesium chloride or other chemical suppressant shall not be applied within 100 feet of any drainage.

18. Soils. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and to extend the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbe health, reduce erosion, and prevent weed establishment.

19. BLM Right of Way Terms and Conditions:

The operator agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC. 9601 *et seq.* or the Resource Conservation and Recovery Act, 42 USC. 6901, *et seq.*) on the ROW (unless the release or threatened release is wholly unrelated to the operator's activity in the ROW). This agreement applies without regard to whether a release is caused by the operator, its agent, or unrelated third parties.

The operator shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the operator shall comply with the Toxic Substances Control Act of 1976, as amended (15 USC. 2601 *et seq*.) with regard to any toxic substances that are used, generated by, or stored on the ROW or on facilities authorized under this ROW grant (see 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or state government as a result of a reportable release of spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or state government.

Pipeline Warning Signs: Pipeline warning signs shall be installed within five days of construction completion and prior to use of the pipeline for transportation of product. Pipeline warning signs are required at all road crossings. Signs shall be visible from sign to sign along the R/W. For safety purposes each sign shall be permanently marked with the holder's name and shall clearly identify the owner (emergency contact) and purpose (product) of the pipeline. Surface Pipelines: All surface pipelines shall be marked with surface signs denoting the type of pipeline, *WARNING* notations, *CONTACT* information. (49 CFR 192-707(c))

Pipeline Testing. The entire pipeline shall be tested in compliance with DOT regulations (49 CFR Part 192). Incremental segments of the pipeline shall be filled to the desired maximum pressure and held for the duration of the test (8 hours minimum). (Ref. 49 CFR 192.503.c).

Pipeline Installation. The laying of the steel surface gas pipeline between PK25 and)E25 pads shall be conducted in a safe manner that minimizes surface and vegetation damage. Specific installation measures shall be presented to BLM for review and approval prior to any pipeline construction.

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: EnCana Oil & Gas (USA) Inc.

Surface Location: SWNW, Section 25, Township 7 South, Range 96 West, 6th P.M.

Well Name	Well No. (Pad)	Bottomhole Location	Lease
Fed.	25-4A (PE25)	NWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-4B (PE25)	NWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-4C (PE25)	NWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-4D (PE25)	NWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-5A (PE25)	SWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-5B (PE25)	SWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-5C (PE25)	SWNW, Sec 25, T7S, R96W	COC27825
Fed.	25-5D (PE25)	SWNW, Sec 25, T7S, R96W	COC27825

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the CRVFO shall be notified. One of the following CRVFOs inspectors shall be notified by phone. The contact number for all notifications is: 970-876-9064. The BLM CRVFO inspectors are Julie King, Lead PET; David Giboo, PET; Greg Rios, PET; and Alan White, PET.

2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Will Howell at 970-876-9049 (office) or 970-319-5837 (cell) for verbal approvals.

3. If a well control issue (e.g. kick, blowout, water flow, casing failure, or bradenhead pressure increase) arises during drilling or completions operations, Will Howell 970-876-9049(office), 970-319-5837(cell) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to CRVFO, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.

4. The BOPE shall be tested and conform to Onshore Order #2 for a **5M** system and recorded in the IADC/Driller's log. A casing head rated to 5,000 psi or greater shall be utilized.

5. Flexible choke lines shall meet or exceed the API SPEC 25C requirements. Flexible choke lines shall be effectively anchored, have flanged connections, and configured to the manufacturer's specifications. Manufacturer specifications shall be kept with the drilling rig at all times and immediately supplied to the authorized officer/inspector upon request. Specifications, at a minimum, shall include acceptable bend radius, heat range, anchoring, and the working pressure. All flexible choke lines shall be free of gouges, deformation, and as straight/short as possible.

6. Prior to drilling out the surface casing shoe, an electrical/mechanical mud monitoring equipment shall be function tested. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.

7. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system. The mud system shall be monitored for hydrocarbon gas/pore pressure changes, rate of penetration, and fluid gain/loss.

8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the well head and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.

9. 1120' feet of Surface Casing will be required on these wells to protect potential water source/aquifers and control loss circulation zones.

10. After the surface casing is cemented, a Pressure Integrity Test/Mud Equivalency Test/FIT will be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1. i. in order to make sure the surface casing is set in a competent formation. This is not a Leak-off Test, but a formation competency test, insuring the formation at the shoe is tested to the minimum mud weight equivalent anticipated to control the formation pressure to the next casing shoe depth or TD. Submit the results from the test via email (whowell@blm.gov) on the first well drilled on the pad and record results in the IADC log.

11. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy in .las and .pdf format will be submitted to CRVFO, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. If the TOC is lower than required or the cement sheath of poor quality, a CRVFO petroleum engineer shall be notified within 48 hours from running the CBL and prior to commencing fracturing operations for remedial operations.

A greater volume of cement may be required to meet the 200-foot cement coverage requirement for the Williams Fork Fm./Mesaverde Group. Please evaluate the top of cement on the first cement job on the pad (Temperature Log). If cement is below the 200-foot cement coverage requirement, adjust cement volume to compensate for low cement coverage.

12. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to CRVFO, Will Howell/Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9063 or asieber@blm.gov for clarification.

13. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CRF 3250-9. Contact Will Howell for clarification.

14. During hydraulic frac operations, monitor the bradenhead/casing head pressures throughout the frac job. Any sharp rise in annular pressure (+/- 40 psi or greater) will terminate the frac operations in order to determine well/wellbore integrity. Notify BLM CRVFO Will Howell 970-876-9049 (office) or 970-319-5837 (cell) immediately.

15. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure and held for 15 minutes without a 2% leak-off. If leak-off is found, Will Howell shall be notified within 24 hours of the failed test but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted within 48 hours after Frac operations.

16. Submit a monthly report of operations or production per CFR 3252.4-3 including any production from these wells in MCFPD, BOPD, BWPD with FTP/SITP until the completion report (Form 3250-4) is filed.

17. Per CFR 3252.4-1(c), not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in a case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3250-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed.

APPENDIX B

Encana's Normal Startup, Operating, and Shutdown Procedures Surface Lines (Gas/Water)

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EnCana Oil & Gas (USA) Inc.	Normal Startup, Operating and Shutdown Procedure Surface Lines (Gas/Water)	Proc #: BLM-001 Revision #: 0 Printed on: 1/27/10
General Operations	AUTHORIZED ON: 12-17-2009	Page 1 of 2

1.0 SCOPE

This procedure provides operators with a safe and consistent protocol to follow should a wild land fire place any surface lines in jeopardy.

2.0 REQUIREMENTS

- Employee shall be trained and qualified in the operations of all equipment associated with surface lines
- Employees shall be trained and qualified in all Safety Policies
- Employees must be trained in the Emergency Response Procedures.

3.0 APPLICABLE DOCUMENTS

- Employee Environmental, Health and Safety Handbook
- Emergency Response Procedures.

4.0 MATERIALS AND EQUIPMENT

- N/A

5.0 SAFETY AND ENVIRONMENT

- Standard Personal Protective Equipment (PPE)

  Hard Hat ANSI Z89.1

  Safety Glasses ANSI Z 87.1

  Steel Toed Boots ANSI Z 41.1

  FRC Clothing

  Gloves
- Report releases in accordance with Employee Environmental, Health and Safety Handbook

Caution:
Ensure a means of communication has been established between pertinent personnel via radio, satellite phones or cell phones. Incident command must establish this means and ensure for all personnel and their actions.

Caution:
Ensure the Emergency Response Plan has been initiated and an EnCana Main Representative has been assigned and communicated to on actions associated with all surface lines. It will be this individual's decision to evacuate the lines if needed.

6.0 PROCEDURE:

6.1 Shutdown and depressurization of surface lines:

CAUTION

IF YOU ARE NOT QUALIFIED TO OPERATE GAS/WATER PIPELINE VALVES OR ASSOCIATED EQUIPMENT BASED ON YOUR TRAINING WAIT FOR TRAINED EXPERIENCED OPERATORS.

6.1.1 Based on direction of the moving fire and communication between EnCana and Wild land fire representative and ensure you have instructions to isolate and possibly depressurize the surface line.

6.1.2 Determine and identify the pipeline isolation valves.

6.1.3 Once pipeline has been isolated call gas control or supervisor and inform them you have isolated this pipeline.

NOTE

Gas Control Phone #Main-970-285-2615, Cell-970-301-1319, 800-791-7691

6.2 Start Up After Incident:

6.2.1 Once the Incident has been terminated then the line must be deemed safe to return to service.

6.2.2 The entire affected surface line must be walked down to ensure the integrity of the line has not been compromised from the passing fire.

6.2.3 Once the previous step has been completed then the appropriate management will determine if pressure testing is necessary prior to placing in service.

Note:

There are several ways to perform the pressure test if needed and documented.

<<END OF PROCEDURE>>